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A review of developments and news of the fishery industries prepared in the BUREAU OF COMMERCIAL FISHERIES.

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COVER: A 800-pound otter-trawl catch of Gulf of Mexico red snappers on the deck of the U. S. Bureau of Commercial Fisheries chartered exploratory fishing vessel Silver Bay. The red snappers were caught in September 1958 during an exploratory trip, the purpose of which was to obtain more facts on the distribution and availability of snapper and grouper in the Gulf of Mexico. (See November 1958 issue, p. 38.)

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A SURVEY OF THE AMERICAN AND JAPANESE ALBACORE TUNA FISHERIES IN THE PACIFIC THROUGH EXAMINATION OF CATCH STATISTICS

By Tamio Otsu*

CONTENTS

ABSTRACT

Catch statistics of the American and Japanese albacore fisheries in the temperate and tropical Pacific Ocean are presented. There has been a fourfold increase in Pacific albacore landings since the prewar years. The Japanese account for about 75 percent of the landings.

Judging by catch statistics alone, the two Japanese North Pacific fisheries appear to be quite stable, even at the present high level of production. There is no indication of a declining resource. While the Japanese South Pacific fisheries are relatively recent in origin, and have not stood the test of time, the present status is encouraging. The American fishery has been beset with marked fluctuations in landings but there is no evidence that fishing has adversely affected the stock.

All indications on the present status of the albacore fisheries point to the parallel rise in effort and catch.

INTRODUCTION

The three major fisheries for albacore tuna, Germo alalunga (Bonnaterre), in the Pacific, all of which are located in the Temperate Zone of the North Pacific Ocean are: (1) the Japanese spring and summer live-bait fishery, (2) the United States west coast summer and fall fishery, and (3) the Japanese winter long-line fishery. In addition, the Japanese tuna long-liners catch much albacore in the tropical Pacific (see fig. 1).

Statistics from each of these fisheries are presented. Certain biological information is also examined for possible clues to the relationship of fish making up the stocks in the various fisheries. By examining the statistics, it is hoped that enough evidence can be gathered which will lead to a knowledge of the population structure of the Pacific albacore, and more important, to a definition of the present status of this important resource. For a population study, much more detailed statistics than are available would be required.

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This study as well as others pertaining to the albacore resources in the Pacific are being conducted by the Pacific Oceanic Fishery Investigations of the U. S. Bureau of Commercial Fisheries under Public Laws 329 (80th Congress) and 466 (Saltonstall-Kennedy Act, 83rd Congress).

MAJOR PACIFIC ALBACORE FISHERIES

JAPANESE SPRING AND SUMMER LIVE-BAIT FISHERY: A description of this fishery has been given by Van Campen[1/], and only a few of the more important points are repeated here. This fishery is conducted near Japan from late April to July, and is a part of the more extensive pole-and-line fishery for skipjack (Katsuwonus pelamis). Boats fishing for skipjack tuna, which appear in early spring off southern Japan, begin to fish for albacore which become available off central Honshu, Japan, about late April or early May. The surface schools of albacore follow the northward extension of the warm Kuroshio Current along the coast of Japan;

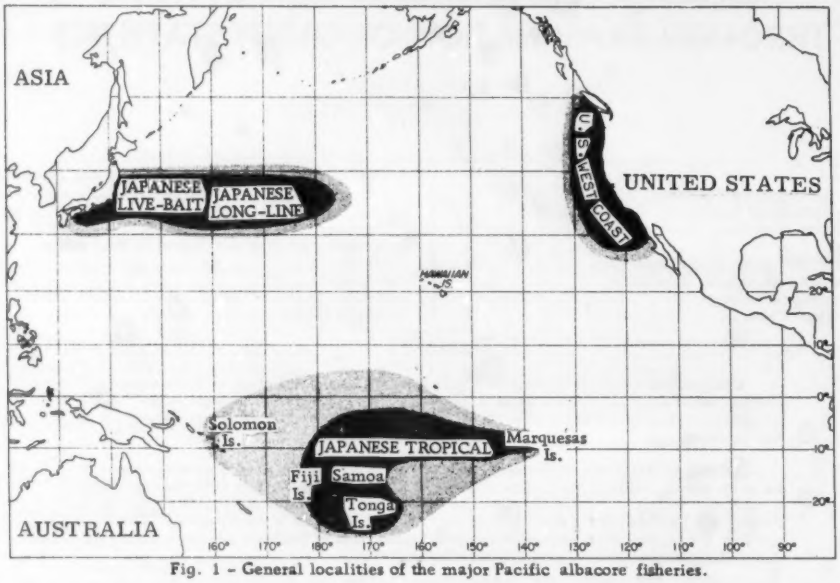

Fig. 1 - General localities of the major Pacific albacore fisheries.

their availability quickly reaches a peak in June, and then rapidly drops off as schools move farther offshore to the eastward. During July, the boats begin to return to skipjack fishing as the albacore go out of range or disperse and become harder to locate. Van Campen has pointed out that in recent years there was an eastward extension of the albacore grounds from about 155° E. to 165° E. longitude, and that this undoubtedly reflects the growing proportion of larger vessels in the fleet which are able to go farther offshore in pursuit of the fish.

UNITED STATES WEST COAST SUMMER AND FALL FISHERY: The albacore occurs along the Pacific Coast of North America from southern Baja California to Alaska between latitudes 25° and 59° N. (Clemens 1955). Since 1945 the majority of the fish have been caught in an area between Baja California and San Francisco within 400 miles of the coast, while between 1937 and 1945 large quantities were also taken off Oregon, Washington, and British Columbia. The year 1956 marked the return of the albacore to Pacific northwest waters after several years' virtual ab-

1/Van Campen, W. G. Manuscript. The Japanese Summer Albacore Fishery. Submitted for publication.

sence. Typically, the fishery begins in June off southern California, develops rapidly in July, reaches a peak in August and September, declines during October and November, and ends in December. Like the Japanese live-bait fishery, it is based on surface schools of albacore. The fish are taken by trolling and live-bait fishing. As the season progresses the fishery tends to move northward along the coast and also outward from the coast.

JAPANESE WINTER LONG-LINE FISHERY: This fishery is conducted between November and April over a broad area of the Temperate Zone of the North Pacific extending from the coast of Japan to the vicinity of 175° W. longitude generally between 30° and 40° N. latitude (Nakamura 1951, Suda 1954). The fishing ground gradually shifts southward as the season progresses, being centered between about 34° and 40° N. in November, and between 26° and 32° N. in March. This southward movement ceases in March and there is a reversal in the movement of the fishery beginning in April. The winter long-line fishery is terminated in April, and the live-bait fishery begins soon after.

The description of this fishery as well as that of the live-bait fishery are overly simplified versions of a more complex picture. Van Campen[1/] pointed out that while Japanese writers often imply that all pole-and-line fishing is done in the spring and summer and all long-lining in winter, some albacore are taken by both methods in all months of the year.

OTHER JAPANESE FISHERIES FOR ALBACORE

Two relatively new fisheries, which yield significant amounts of albacore for the Japanese, are the mothership-type fishery and the so-called "foreign-based fishery," both of which exploit albacore along with other species of tunas in the tropical Pacific Ocean. Fishing is done by the long-line method. The mothership-type tuna operations began soon after World War II, while the fisheries based in foreign ports are of more recent origin.

MOTHERSHIP-TYPE FISHERY: The first large-scale commercial mothership-type tuna expedition in Japanese fisheries history was undertaken by the Taiyo Fishing Co., Ltd., in June 1950 following a directive issued by the Supreme Commander for the Allied Powers which permitted the Japanese to send expeditions to certain defined areas of the high seas adjacent to the Caroline, Marianas, and Marshall Islands. This expedition was composed of a 10,000-ton mothership and 25 long-line boats ("catchers"), which fished for a period of 2½ months. Details of this venture and several which followed, as well as the history of this type of operation in the Pacific, are presented by Shimada (1951), Ego and Otsu (1952), and Van Campen (1952). Such expeditions were authorized under the premise that fishing vessels operate only within a specified area, and under the rigid control and supervision of a mothership. That the Japanese found these large-scale ventures successful is attested to by the fact that they have been continued even after all restrictions on movements on the high seas were removed by the ratification of the Peace Treaty.

The announced plans for 1958 mothership operations involve three separate expeditions as follows: A 3,000-ton mothership and 23 catchers operating from May 20 through September 30, a 3,800-ton mothership and 35 catchers operating between May 10 and September 20, and an 11,000-ton mothership with 50 catchers operating in August and November.[2/] These operations are reported to be similar in scope to the 1957 operations.

FOREIGN-BASED FISHERIES: At the present time there are two fisheries operating out of foreign ports in the Pacific; one at Espiritu Santo, New Hebrides, and

1/See page 2.
2/Fisheries Economic News.

the other at Pago Pago, American Samoa. No statistics are available for the operation based in New Hebrides; an enterprise reportedly involving American, British, and Japanese capital. According to information available, the fishing base was completed in November 1957, and operations were under way in July 1958 with about eight Japanese tuna long-line boats.

The fishery in American Samoa, a joint enterprise between a large United States west coast cannery and certain Japanese fishing firms, began in 1954 (Van Campen 1954). Starting with a small fleet of 7 Japanese tuna boats, this operation has expanded considerably, and today the American Samoa cannery is being served by a fleet numbering more than 30 long-liners. Albacore, along with other tunas and spearfishes, are landed throughout the year. There is no clear seasonal variation in albacore landings but the more productive months appear to be from August through February.

ALBACORE LANDINGS IN THE UNITED STATES AND JAPAN

Annual United States west coast and Japanese albacore landings are presented in figure 2. These and other statistics given in this article are in short tons. The source data are those cited by Van Campen.1/ The Japanese landings include fish taken by the two major fisheries as well as lesser amounts landed by independently-

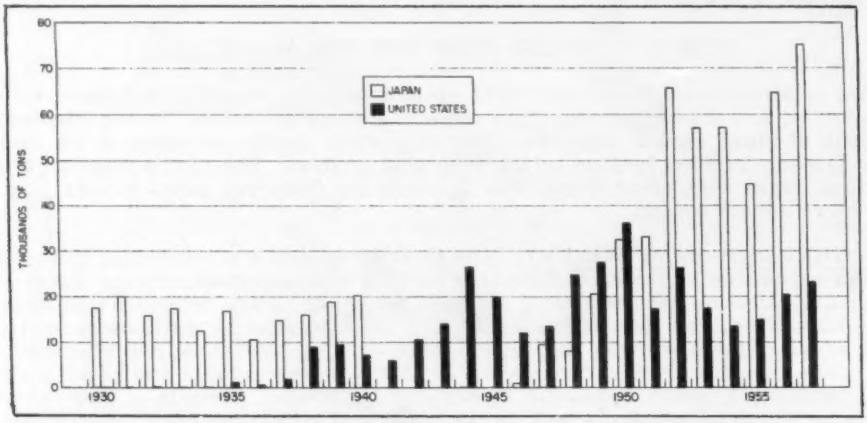

Fig. 2 - Japanese and United States west coast annual albacore landings, 1930-57.*

*The 1957 Japanese landings were obtained from statistics provided by the Nankai Regional Fisheries Research Laboratory, Japan.

operating tuna long-liners from tropical waters of the Pacific and Indian Oceans. The statistics do not permit segregation of Pacific and Indian Ocean albacore landings. However, since most of the albacore are taken in Pacific waters, it is probably of little consequence to ignore the distinction, and perhaps even consider the Indian Ocean as a further extension of the Pacific grounds. There are certain irreconcilable discrepancies. Judging from the landings shown in figure 2 and the annual landings of the two major fisheries shown in figure 4, it appears that Japanese landings accounted for by other than the two major fisheries are included in the figures of total Japanese landings only for certain years. The figures as given by Japanese sources are presented without any adjustments.

The United States landings of albacore were at an extremely low level during the early 1930's. Albacore providied the major portion of the tuna pack from the beginning of the industry in California in 1903 to the early 1920's. There were average landings of about 9,000 tons a year between 1916 and 1925--the years for which statistics are available. Following a record year in 1925 when about 11,000 tons

1/See page 2.

were landed, albacore suddenly failed to appear on the West Coast in its usual abundance. For the next 12 years the albacore catch was negligible in the United States. In waters off the Pacific Northwest, albacore showed up in commercial quantities for the first time in 1937, and a commercial pack was put up in Oregon and Washington in 1938 (Powell and Hildebrand 1950). This marked the beginning of a fishery in the Pacific Northwest which grew for several years and reached a peak in 1944 with landings of 17,000 tons. This fishery then declined until virtually no landings were made in 1952. In 1956 the albacore again returned in commercial quantities to waters off the Pacific Northwest.

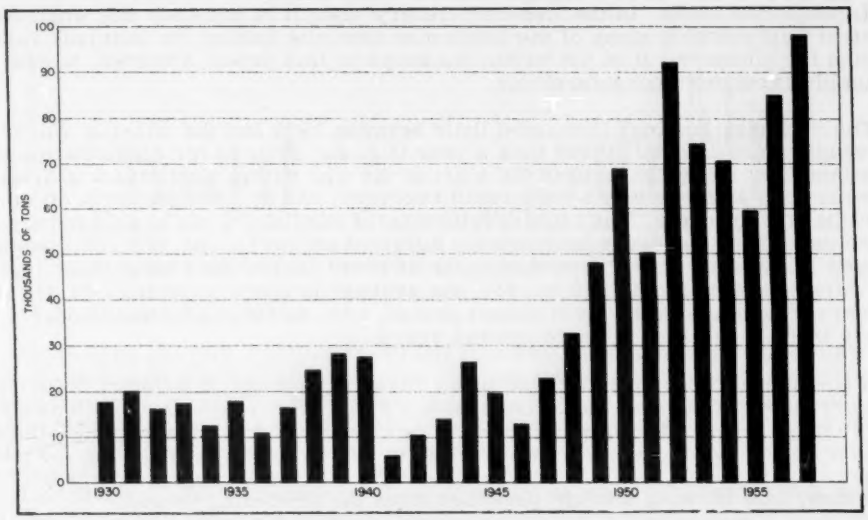

Fig. 3 - Total annual albacore landings (United States and Japan), 1930-57.

Following the recovery of the fishery around 1938, there have been some marked fluctuations in the landings from year to year, reaching relatively high levels in 1944 (26,000 tons) and in 1950 (36,000 tons). After peak landings in 1950, there was a gradual drop to a low of 13,500 tons in 1954. But in the last few years landings have again increased.

The Japanese began to export albacore to the United States in 1931 following the drastic drop in landings on the United States west coast. Prior to the establishment of this important export market, which has grown steadily over the years and has in recent years become a matter of serious concern to the United States fishing industry, Japanese fishermen had never sought this fish for domestic consumption (Van Campen[1/]). The albacore is considered too soft in texture, too pale in color, and even tasteless, by the Japanese who customarily eat tuna raw ("sashimi"). The export market, which developed in response to the failure of the California albacore fishery in the late 20's, has continued to grow because of the increasing demand in the United States for canned albacore which could not be supplied by United States landings alone.

Like most large commercial fisheries, the albacore fishery in the United States occasionally suffers serious setbacks due to economic difficulties. For example, Samson (1955) points out that had price disputes not hampered fishing in the middle of the 1955 season, albacore production that year could have been much greater because there apparently were unusually heavy runs of albacore at that time. However,

1/See page 2.

it appears that in general the West Coast landings have fluctuated according to the availability of fish along the West Coast.

Japanese landings of albacore are also dependent upon economic considerations, to perhaps an even greater extent than the United States fishery. This situation is aggravated by the fact that nearly all albacore are exported. It has been reported that when an unfavorable export situation exists, and prices are low for albacore taken in the spring live-bait fishery, many of the boat owners are reluctant to go into winter long-lining for albacore, and may instead, turn their efforts toward fishing in the tropical Pacific or engage in some other fisheries such as that for mackerel (Anonymous 1958). In the live-bait fishery also, it is possible that when conditions are unfavorable many of the boats may continue fishing for skipjack rather than fish for albacore. It is not within the scope of this paper, however, to deal with the complex economic considerations.

The Japanese landings fluctuated little between 1930 and the onset of World War II, averaging a little over 16,000 tons a year (fig. 2). Fishing for albacore apparently continued for a few years after the start of the war but no statistics are available. Following the war there was a very rapid recovery, and by 1950 the production exceeded the prewar levels. The rapid development of this fishery can be seen more clearly if we examine the average landings for different periods. The 1930-35 landings averaged 16,706 tons a year, and during the 1936-40 period the average was 16,110 tons. After the war, from 1946 to 1950, the average dropped slightly to 14,344 tons. The average landings in the most recent period, 1951 to 1957, climbed to 56,771 tons, or more than three times those of prewar years.

In comparison with this increase in the level of landings, the United States landings increased at a far less spectacular rate. From an average of 5,562 tons a year in the 1936-40 period, during which there was a recovery from the virtual failure in the fishery, landings increased to an average of 22,755 tons a year during the postwar period of 1946-50. In the recent period, 1951-57, the average landings have been 18,976 tons, thus showing a slight decrease from the preceding period.

The combined yearly albacore landings of the United States and of Japan for 1930 to 1957 are shown in figure 3. With the exception of the war years, total landings of the two countries have shown a rather marked upward trend. From average annual landings of just under 17,000 tons in the 1930-35 period, the present level has reached approximately 76,000 tons (1951-57). This fourfold increase over the prewar period reflects the greatly increasing United States demand for canned tuna, of which albacore is the most highly prized.

That Japan is the leading producer of albacore is clearly seen in figure 2. Only during the war years and a few years following did the United States take the lead in total production. From 1951 to 1957, Japan accounted for an average of 75 percent of the total combined landings of the two countries.

TRENDS IN THE JAPANESE FISHERIES

TEMPERATE NORTH PACIFIC FISHERIES: Annual Japanese landings of the spring live-bait and winter long-line fisheries are compared in figure 4. Similar statistics are unavailable for 1938-1945. From 1931 through 1937 there was a steady decline in the landings of the live-bait fishery. The long-line fishery, on the other hand, showed some increase around 1935. This increase was due largely to a concerted effort made by the Japanese Government to compensate for the decline in pole-and-line catch by exploring grounds farther offshore beginning in 1933. The exploratory program resulted in an extension of the long-line grounds eastward. The landings correspondingly increased to a point where this fishery constituted the major source of albacore to the Japanese for a few years following.

In recent years the live-bait fishery has come to dominate tuna landings. Between 1951 and 1957, the live-bait fishery accounted for an average of 64 percent of the landings made by these two fisheries. This increased yield of the live-bait fishery has also been accompanied by an extension of grounds eastward, which was made possible by the addition of larger vessels in the fleet.

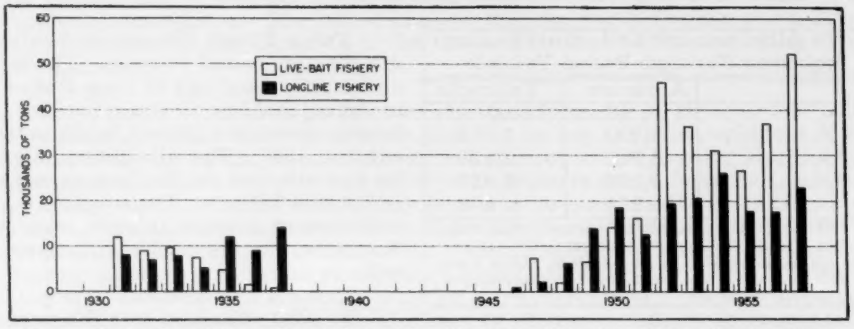

Fig. 4 - Comparison of the landings of the Japanese live-bait and long-line albacore fisheries. (Long-line landings do not include fish taken on mothership-type operations or by vessels based in foreign ports.)

The 1957 figures are estimated from monthly statistics provided by the Nankai Regional Fisheries Research Laboratory, Japan.

FISHERIES IN THE TROPICAL PACIFIC: For convenience in discussing the catch statistics of tropical albacore, two distinct fisheries have been described for the tropical Pacific, (1) the mothership-type fishery, and (2) the foreign-based fishery. In (1) the fishing vessels operate around a mothership using the latter as a base, and in (2) the vessels work out of a foreign land base. But there is little basis for considering these as separate fisheries. Both exploit subsurface tunas by the long-line method, and there are no clear seasonal or area differences that would make each distinct from the other.

While not given a special designation like the other fisheries, the numerous independent Japanese long-liners which ply the waters of the tropical Pacific and eastern Indian Oceans are nevertheless important contributors of long-line albacore. These vessels, capable of operating for considerable periods without logistic support of motherships or land bases, account for significant quantities of tropical tuna. Their contributions are reflected in the tremendous increase in overall Japanese albacore landings (fig. 2).

The annual albacore landings by the mothership-type operations are given in table 1. For purposes of comparison the landings of yellowfin tuna (Neothunnus macropterus) are also shown.

Table 1 - Albacore and Yellowfin Landings of Japanese Mothership Fleets[1/]

Year	Albacore	Yellowfin
	... (Short Tons) ...	
1956	4,069	2,229
1955	5,409	3,221
1954	3,920	4,285
1953	321	4,794
1952	79	4,429
1951	137	5,432
1950	49	4,109

1/ 1957 figures are unavailable.
Sources: Annual Reports of Catch Statistics on Fishery and Agriculture, Statistics and Survey Division, Japanese Ministry of Agriculture and Forestry, 1955 edition; 1956 figures, source cited as the Japanese Fisheries Agency.

Yellowfin dominated the mothership landings during the first few years of operation, while albacore has become an important constituent only in more recent years. This is mainly a reflection of the shift in area of operations of the fleets, which during the period of restrictions exploited waters of the U. S. Trust Territory of the Pacific Islands, lying to the north of the Equator, where the predominant tuna species are the yellowfin and big-eyed (Parathunnus sibi) tunas. Probably

because of the favorable acceptance of long-line caught albacore in the market, many of the fleets now operate in more southern waters, such as in the vicinity of Fiji and Tonga Islands, where albacore are found in great numbers. In 1955 and 1956, albacore landings outweighed yellowfin landings by 40 and 45 percent, respectively. Unquestionably there has been a shift in emphasis on the part of the Japanese toward a higher production of albacore in recent years.

Table 2 - Albacore and Yellowfin Landings of Japanese Foreign-Based Vessels

Year	Albacore	Yellowfin
	. . . (Short Tons) . . .	
1957	6,236	1,719
1956	3,781	2,159
1955	3,228	2,895
1954	270	638

Sources: 1954 and 1957 figures are from records of cannery in America Samoa. Weights of gilled and gutted yellowfin were roughly adjusted to round weights by adding 9 percent; 1955 and 1956 figures ascribed to Japanese Fisheries Agency.

Table 2 lists the annual landings of the foreign-based vessels. These are essentially landings of long-liners based in American Samoa since the New Hebrides operation did not begin until November 1957. The albacore and yellowfin are also the major tuna species taken by this fishery. Here again, a shift in dominant species is seen, similar to that shown by the mothership-type fishery.

In 1954 yellowfin was the predominant species, and albacore accounted for only 30 percent of the combined albacore and yellowfin landings. In 1955, albacore accounted for 53 percent; in 1956, 64 percent; and in 1957, 78 percent of the combined landings of these two species. Thus there has been a gradual tendency for albacore to figure more importantly in the Samoa catch each year since the inception of this fishery.

This shift has come about from a movement away from the old fishing grounds, which in 1954 and early 1955 were chiefly in the vicinity of Samoa and to the north. As vessels began working in more distant and southerly waters (e.g. Tonga Islands), catches of albacore increased noticeably. Today, more and more fishing is done in waters productive of albacore, a shift in emphasis which can be attributed largely to the good canning quality of these long-line caught tropical albacore and the higher price this species generally commands.

RELATIONSHIP OF ALBACORE TAKEN IN THE VARIOUS FISHERIES

At present little is known of the relationship of albacore found in different parts of the Pacific Ocean. As mentioned, the bulk of the Pacific albacore production is from the Temperate Zone of the North Pacific with Americans and Japanese conducting seasonal fisheries for the species. Available evidence from tag returns leads us to believe that there is a single population of albacore in the North Pacific (Blunt 1954, Ganssle and Clemens 1953, and Otsu MS[3/]). Albacore tagged off the United States west coast have been retaken off the coast of Japan, and those tagged in mid-ocean north of Hawaii have been retaken in the Japanese fishery as well as in the United States west coast fishery, thus showing that there is considerable movement of fish from one fishery to the other. The tag returns, therefore, support the contention that the Americans and Japanese are both exploiting a single, intermingling population of albacore in the Temperate Zone of the North Pacific.

Furthermore, examination of gonads of albacore from various areas has shown that the Temperate Zone North Pacific fish are without exception juveniles, or are sexually-immature adults which evince no signs of incipient or past spawning (Otsu and Uchida, in press). It appears then that the North Pacific albacore are but a segment of a much larger population which is ecologically separated into spawning and nonspawning components. This same study suggests that the spawning segment of the population occurs in tropical or subtropical waters. There may be a movement

3/Otsu, T. Manuscript. Albacore Migration and Growth in the North Pacific Ocean as Estimated from Tag Recoveries. Prepared for publication in Pacific Science.

of the larger fish from Temperate Zone waters into subtropical waters, possibly into the North Equatorial Current area where some spawning appears to take place (Ueyanagi 1957, Otsu and Uchida, in press), or possibly farther south into the equatorial Pacific. It may be that these large fish spread out over a vast area in the tropical Pacific, or, as postulated by Suda (1956), the albacore occurring in the tropical South Pacific may comprise a spawning group of another population to be found in the southern hemisphere. The latter implies that the north Temperature Zone albacore is unrelated to the albacore of the tropical South Pacific now being exploited by the Japanese.

Obviously, there is much to be learned about the population structure of this valuable resource. While there does not appear to be any serious problems of overexploitation facing any of the Pacific albacore fisheries at the present time, a knowledge of the population structure would be of vital importance in formulating conservation or management policies should they prove to be necessary. If there are several discrete populations of albacore, the depletion of one would of course not affect a fishery based on another population. If however, the Americans and the Japanese are exploiting a single population of albacore in the North Pacific, then the problems concerning the resource would necessarily be of mutual concern. In this situation the effect of overexploitation would not be confined to whatever fishery is responsible, but would be shared by the other fishery as well. It is clear that the knowledge of the population structure constitutes a valuable adjunct to the understanding of problems inherent in these fisheries.

Although not well documented, frequent reference is made to the apparently close relationship between the major North Pacific albacore fisheries, that good and bad years appear at the same time in both the American and Japanese fisheries. If such a relationship does exist, it would be well worth noting because the American fishery follows the Japanese live-bait fishery in time, and the American industry is in a position to benefit by an advance indication of the relative magnitude of the season's landings.

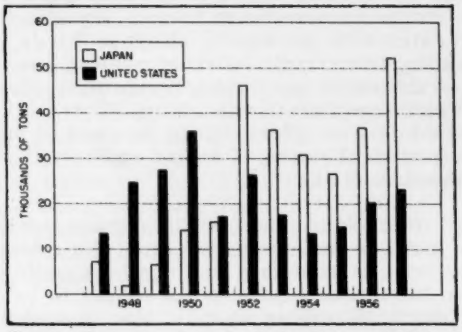

Fig. 5 - Comparison between the landings on the United States west coast and by the Japanese live-bait fisheries, 1947-57.

In figure 5, landings on the United States west coast and by the Japanese live-bait fisheries are compared. For the more recent years, after 1950, the landings show some corresponding trends. For example, 1952 was a particularly good year in both fisheries, and 1954 and 1955 were relatively poor in both. This apparent relationship breaks down if the earlier years are included.

From the point of view of fish sizes exploited by these two fisheries, with the American fishery taking smaller fish in general than the Japanese fishery (Otsu, T.[3]), it would appear more reasonable to expect correspondence in landings not on a year-to-year basis, but rather between year N in the American fishery and year N+1 or N+2 in the Japanese fishery if the fluctuations in annual landings are reflections of actual abundance. This assumes that availability factors remain the same from year to year, which of course is not entirely true for the albacore. While it is possible that an exceptionally good year in the Japanese fishery would be followed by a good season in the American fishery, or vice versa, there are probably other factors which affect the occurrence of fish in the two fisheries to such an extent that any clear relationship in the landings could not be expected.

3/See page 8.

DISCUSSION

It has not been possible to compile satisfactory statistics on fishing effort to be examined in relation to the gross landings statistics presented in this report. It is known that following the war the Japanese have continued to enlarge their fishing fleets, and have built larger vessels capable of fishing in more distant waters. A recent survey conducted by the United States Department of the Interior (Anonymous 1958) found that the number of Japanese fishing vessels had doubled since 1951. This expansion, although not applied to the albacore fishery alone, has nevertheless affected the catch of albacore, particularly in that portion of the landings accounted for by the numerous independently-operating long-liners fishing in distant tropical waters. While the Japanese have increased their fishing capacity with a view toward increased production, the situation on the United States west coast has been quite different. According to the same survey, the United States albacore fleet has been reduced from 3,000 to 1,000 boats in recent years. The general situation can perhaps be deduced from conditions prevailing in the tuna industry as a whole. According to Samson (1957), the 1957 California tuna clipper fleet (vessels over 50 gross tons) numbered only 146 as compared to the 1951 total of 210. Similarly, the tuna purse-seine fleet underwent a drastic reduction of from 163 vessels in 1947 to 58 by the end of 1957.

The available data on fishing effort do not permit a detailed analysis of the effect of effort on the level of landings. Judging from gross catch statistics alone, it might be reasonable to deduce, however, that there was perhaps a parallel increase in catch with increasing effort in the Japanese fishery. The fact that their present landings are triple those of prewar years attests to this. It is of course possible that the catch has not kept pace with effort, and that there is a general leveling off of catch relative to the rising effort. It is not possible to determine this without detailed data on effort, but in the face of the continued high level of production in the last several years, it seems unlikely that exploitation has seriously affected the albacore stock.

While it is true that the Japanese have had to build larger vessels and go farther from Japan in order to meet their catch goals, it must be realized that the present level of albacore landings is significantly higher than the prewar level. Their two North Pacific fisheries appear to be quite stable, even at the present high level of catch. There is no indication of a declining resource. While the South Pacific fisheries are relatively recent in origin and may not have stood the test of time, the present status of the Samoa-based fishery or the mothership operations is encouraging as far as albacore catch is concerned.

Catch statistics, although not reliable when considered alone, indicate that the albacore resources in the Pacific are extensive, and that production can probably be increased particularly by exploitation of new grounds, as shown by the Japanese in the South Pacific. In the absence of catch per unit-of-effort data it is not possible to evaluate the situation in the present North Pacific grounds with any degree of confidence. While the annual fluctuations in the landings of these fisheries from "good" through "poor" years may possibly indicate that much heavier exploitation will not substantially increase production, it also appears unlikely that these fisheries are being overexploited at present. All indications on the present status of the albacore fisheries point to a parallel rise in effort and catch through a background of erratic natural fluctuations.

SUMMARY

1. Catch statistics are presented for the major Pacific albacore fisheries which include: (1) the United States west coast summer to fall fishery, (2) Japanese winter midocean long-line fishery, (3) Japanese western Pacific spring to summer live-bait

fishery, (4) Japanese tropical Pacific mothership fishery, (5) Japanese tropical Pacific foreign-based fishery.

2. The American fishery has been beset with marked fluctuations in production. With the establishment of the canning industry in California in 1903, albacore landings increased until 1925 when the species suddenly failed to appear on the west coast in its usual abundance. Landings were negligible until around 1938. In the last decade, the landings have shown a downward trend following the peak year of 1950 with 36,000 tons until 1954 when approximately 13,500 tons were landed. The last few years again showed a trend toward greater catches.

3. The Japanese landings of albacore, which averaged a little over 16,000 tons a year between 1930 and the onset of World War II, have in recent years increased to an average of more than 55,000 tons (1951 to 1957), or more than three times those of prewar years. This tremendous increase reflects the increasing demand in the United States for canned albacore, since the bulk of the Japanese landings are exported to the United States for that purpose.

4. Japan accounts for an average of 75 percent of the combined albacore catch of the two countries, United States and Japan.

5. Of the several Japanese fisheries for albacore described, the two oldest, and also the most important, are the winter long-line and the spring-summer live-bait fisheries. Both of these fisheries are conducted in the Temperate Zone of the North Pacific. The live-bait fishery is the leading source of Japanese albacore.

6. The tropical fisheries are relatively recent in origin. Two distinct tropical fisheries, the mothership and the foreign-based, are described. There is a third category, not considered in this report due to lack of separate statistics, and this is the group of independent Japanese tuna long-liners which operate in tropical waters without benefit of either a mothership or a foreign base. These vessels undoubtedly account for significant quantities of albacore. In the tropics all albacore are taken by the long-line method, and seasons are not clearly defined as in the Temperate Zone North Pacific fisheries. It is shown that albacore has come to figure more prominently in the landings of these fisheries in recent years, and this is believed due to a purposeful shift in species emphasis.

7. Since frequent reference is made to the apparently close relationship between the American and Japanese fisheries, that good and bad years appear at the same time in both fisheries, the landings of the American fishery were compared with landings of the Japanese live-bait fishery. A relationship as alluded to is not clearly evident.

8. Although detailed data on albacore fishing effort are not available, the general situation prevailing in the tuna industries of the two countries may be indicative of any general trends. This shows that the Japanese have been building larger vessels and have continued to enlarge their fishing fleet ever since the end of World War II. In addition, they have expanded their fishing grounds to include more distant waters. Along with this increasing effort, there was a parallel rise in the level of albacore landings. The situation is apparently quite different in the American albacore fishery and it is unlikely that there was any increase in fishing effort over the last few years.

9. Catch statistics of the various albacore fisheries show no evidence that exploitation has had any detrimental effect on the albacore stock. There appears to have been a parallel rise in effort and catch through a background of erratic natural fluctuations.

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SWIMMING SPEEDS OF FISH

Swordfish can swim at speeds up to 70 miles an hour; the wahoo can hit 37, the blue shark 24, salmon 24, trout 23, pike 20, bass 12, carp 7.6, and man 4.01.

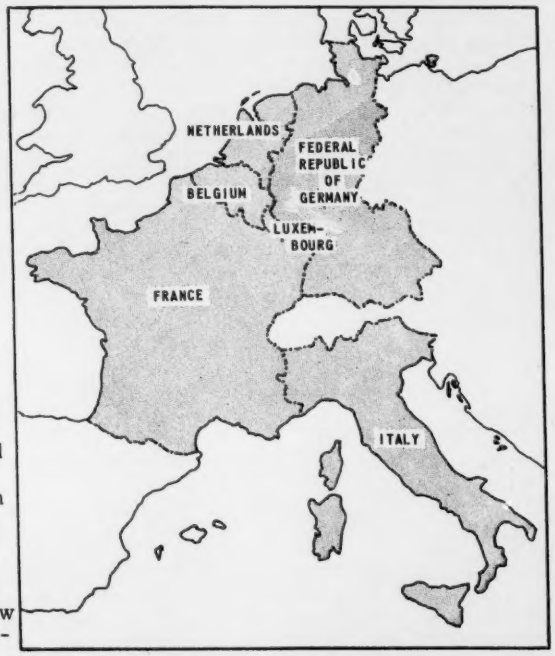
THE EUROPEAN COMMON MARKET AND THE UNITED STATES FISHING INDUSTRY

By Thomas G. Lopp *

CONTENTS

SUMMARY

Six western European nations--Belgium Netherlands, Luxembourg, Federal Republic of Germany (West Germany), France, and Italy--have agreed to unite their economies by eliminating tariffs among themselves and by establishing a uniform external tariff structure toward the rest of the world. To permit gradual adjustments to new conditions, the six countries will develop this new economic union, known as the European Common Market (also known as the European Economic Community), 1/ over a period of 12 to 15 years and arrive at a complete customs union at the end of that period. The United States and other parties to the General Agreement on Tariffs and Trade (GATT) will seek to insure that the six countries form their new tariff structure in conformance with the principals of that Agreement.



Since the United States exports up to 90 percent of its production of menhaden oil to the Netherlands and West Germany, the United States has a direct interest in the Common Market tariffs to be established on this and other competitive oils.

The six Common Market countries tentatively plan to base the new tariff rates on the averages of present import fees. At present, menhaden oil enters the Netherlands and West Germany duty free. Belgium and Luxembourg have an import tax on fish oils; France and Italy have import duties on these

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1/ Includes the overseas territories of Belgium, France, Netherlands, and Italy with some special provisions.

Note: The European Common Market is not to be confused with the European Free Trade Area, which is a proposal now being negotiated. The Free Trade Area would associate the United Kingdom and 10 other member countries of the Organization for European Economic Cooperation (OEEC) with the six-nation Common Market. A free-trade area differs from a customs union (such as the European Common Market) in that, while both eliminate internal restrictions, only the customs union has a common external tariff. Each member of a free-trade area maintains its own tariffs against imports from nonmembers.

oils. A new uniform tariff rate on menhaden oil based on the average import fees of the six countries might be as high as 13 percent ad valorem.

Margarine producers in the Netherlands and West Germany use United States menhaden oil as an ingredient of margarine because they can obtain it in large volume at a low price. Several organic oils are used somewhat interchangeably, the proportion of each depending on the price of individual oils and on the grade of margarine being produced. Since menhaden oil enters this trade on the basis of its low price, an import duty established by the Common Market countries would lower its competitive position.

In addition to tariff changes, the Common Market includes an agriculture-expansion program and a program to fully use and develop the resources of member nations. These programs may also retard the imports of menhaden oil. Under these programs, should the six nations decide to expand their own production of organic oils, imports may be limited or excluded.

Even without trade restrictions, the European margarine processors who now use menhaden oil may turn to the use of other ingredients. In anticipation of a need for new markets, United States chemists are attempting to find new uses for menhaden oil.

On other United States fishery products the European Common Market probably will establish import tariffs that will be higher than the tariffs now enforced by the principal importing countries of the new economic union. The six countries also could exclude imports of fishery products altogether in an attempt to build up their own fisheries under the proposed programs mentioned. However, the United States now exports only small quantities of canned salmon, canned sardines, and other food fish to Common Market countries and even the complete exclusion of those fishery products would have little immediate effect on the food-fish fisheries of the United States. But in the future, if the Common Market countries improve their economy and develop increased purchasing power for dollar goods, and if liberal trade policies prevail, the six nations may increase their buying capacity for United States fishery products.

SIX COUNTRIES MAY REVISE IMPORT REGULATIONS

On January 1, 1958, Belgium, Netherlands, Luxembourg, West Germany, France, and Italy signed a treaty to create a Common Market to improve their economies. If the treaty is enacted as planned, the pattern of European economic life will change markedly over the next few decades, and the effects of the change will be felt throughout the world. The countries formed the Common Market on January 1, 1959. Once the Common Market becomes fully effective, goods will move among the six countries free of duty and the countries will have a uniform tariff on imports from the outside world.

The basic idea of the Common Market appears simple, but the six nations face the complex problems of setting up a new tariff schedule that will put a minimum import burden on their own industries. At the same time, the six countries must meet their trade and tariff obligations to the rest of the world.

The first real step toward integrating the six economies was the lowering of internal tariffs and the liberalizing of import quotas on January 1, 1959.

The Common Market countries had planned to begin to eliminate internal tariffs on January 1, 1959, and to begin to harmonize external tariffs on January 1, 1962. They expect to complete the new tariff structure in 12 to 15 years. Gradual modification over the long period will ease the strain on affected producers (both inside and outside the Common Market area), who must adjust to the new tariff structure.

Temporarily, pending final negotiations for the 17-nation Free Trade Area, the Common Market countries have deviated from their original plan and have applied their January 1, 1959, tariff cuts toward all GATT nations. They did this as a gesture of good will--mainly toward other OEEC nations who fear a loss of trade. The OEEC nations had been invited to join the Common Market, but they chose to retain their economic sovereignties and form the less stringent Free Trade Area through which they not only hope to avoid loss of trade but hope to receive some of the benefits of the Common Market.

Although the Common Market countries will cut their purchases of goods from the outside at first, under the originally proposed plan several factors indicate that the economic union can ultimately benefit outside countries. The Common Market system should stimulate more efficient production within the area and subsequently greater purchasing power with which to pay for imports. The Common Market treaty contains antitrust provisions against certain practices of cartels. In addition, the six countries may ease import-license and foreign-exchange restrictions, which now form stringent trade barriers in France and Italy. Statesmen of the six countries assure that the commercial policies will be designed to increase the Common Market trade with the rest of the world.

The six countries propose to base most common external tariff rates on an arithmetical average of the tariff rates in effect on January 1, 1957. As these countries begin to trade freely among themselves, producers on the outside--who wish to export goods into the Common Market area--may face new competition. Reduced internal tariffs and increased external tariffs may necessitate marketing adjustments for products with established markets in any of the six countries.

In designing the new economic union, the Common Market countries must consider their individual foreign trade commitments. Since the six countries propose to reduce the tariff rates to each other and to form a common external tariff based on an arithmetical average of present tariffs, they must either obtain waivers from present tariff commitments and obligations contained in the General Agreement on Tariffs and Trade (GATT), or renegotiate new duty rates.

The GATT was organized to improve world economy by increased international trade; its members include the United States, the Common Market nations, and most of the other free nations of the world. Under the Gatt, if one member country reduces or binds a duty to another, that duty shall apply equally to all GATT countries. Inasmuch as the GATT favors the establishment of free-trade areas and the advancement of world trade--and the Common Market proposes both--the GATT countries generally approve of the basic plan proposed by the six Common Market countries, although they do not approve in all cases of the proposed increased tariff rates.

The United States will have a voice in shaping the structure of the Common Market when its representatives discuss with representatives of other Gatt countries the formation of the Common Market in relation to the GATT. The United States will encourage the Common Market to establish a tariff structure that will permit liberal entry of United States goods.

TRADE RESTRICTIONS MAY AFFECT UNITED STATES MENHADEN INDUSTRY

Unification of the tariffs of the six Common Market countries may create restrictions that will affect the United States menhaden fishery. During recent years, up to 90 percent of the United States production of menhaden oil has been marketed in West Germany and the Netherlands where it has entered duty free. If the Common Market should place a duty on menhaden oil under its proposed uniform tariff structure, United States producers could lose their price advantage, and thereby their principal market to closely competitive products. 2/

2/ See p. 20 for latest information on effect of Common Market on Netherlands importation of menhaden oil.

The tariff rates on menhaden oil in the Common Market countries are as follows: For the Benelux countries (Belgium, Netherlands, and Luxembourg) and Italy there is no duty; West Germany also has no duty, except that oil containing more than 50-percent fatty acids is dutiable at 4 percent ad valorem; and France has a duty of 18 percent ad valorem which has been suspended temporarily. Other import trade restrictions exist: Belgium-Luxembourg has a sales tax of 5 percent on duty-paid value; France has an import tax of 24 percent and a stamp tax of 3 percent of total customs charges; and Italy has a sales tax of 3 percent on duty-paid value. France and Italy now restrict the quantities of fish oil imported from dollar countries through import-license requirements.

Table 1 - United States Production of Menhaden Oil, 1950-57

Year	Quantity 1/	Value
	1,000 Lbs.	US$1,000
1957	118,484	9,466
1956	168,211	14,092
1955	159,241	12,195
1954	139,811	9,755
1953	133,684	8,806
1952	96,665	5,785
1951	94,028	9,771
1950	76,575	5,867

1/ Converted from gallons at 7½ pounds per gallon.
Source: Bureau of Commercial Fisheries. Fishery Statistics of the United States, 1950-56, and Fish Meal and Oil, 1957.

A new external tariff rate on menhaden oil based on the arithmetical average of official import duties for the four Common Market customs areas would be 4½ percent ad valorem. If a new rate is based on the arithmatical average of import duties and import taxes combined, the duty would be about 13 percent ad valorem.

In 1956, a concession on menhaden oil was granted by the Benelux countries at the GATT Conference in Geneva. The concession granted in negotiations with the United States consisted of binding the duty-free status of menhaden oil. This product is also exempt from Netherlands monoply fees or corresponding Belgium-Luxembourg charges if imported for further processing. Under the rules of the GATT, now that the duty-free status is bound, Benelux cannot place a duty on menhaden oil unless they would compensate by granting the United States another concession to offset any loss in trade caused by an increased duty.

THE UNITED STATES MENHADEN INDUSTRY

The United States now accounts for practically all the world's catch of menhaden. Additional stocks of menhaden exist beyond the range of present operations of the United States fishing fleet, but commercial fishing possibilities are uncertain. The United States menhaden industry could increase its landings by establishing menhaden reduction plants in remote areas or by building floating reduction plants. Rather than expand fishing operations, the immediate concern of the menhaden industry is to maintain existing markets for its products or develop new markets.

Table 2 - United States Exports of Crude Fish-Body and Fish-Liver Oils, 1952-57

Country	Quantity						Value					
	1952	1953	1954	1955	1956	1957	1952	1953	1954	1955	1956	1957
	(1,000 Lbs.)						(US$1,000)					
Common Market Countries:												
Netherlands	23,933	17,827	87,385	80,519	49,648	27,815	1,884	1,238	6,655	6,827	4,409	2,543
Belgium-Luxembourg	17	1,527	0	2,197	1,499	1,323	7	108	0	188	121	115
France	298	14	0	5	0	9	27	3	0	1	0	1
West Germany	10,268	72,311	20,962	21,006	63,484	52,593	756	5,018	1,637	1,683	5,908	4,893
Italy	440	56	39	65	120	350	49	10	4	8	19	42
Total	34,956	91,735	108,386	103,792	114,751	82,090	2,723	6,377	8,296	8,707	10,457	7,594
Other Countries	7,746	14,844	32,397	38,386	25,830	32,688	647	1,127	2,607	3,073	2,384	3,126
Grand Total	42,702	106,579	140,783	142,178	140,581	114,778	3,370	7,504	10,903	11,780	12,841	10,720

Source: Bureau of the Census. United States Exports of Domestic and Foreign Merchandise, 1952-57.

Between 1950 and 1956 landings of menhaden doubled, whereas landings of other fish in the United States declined. The sharp increase in menhaden landings followed an apparent increase in abundance of menhaden along the Atlantic coast and increased menhaden fishing in the Gulf of Mexico. A decline in the availability of California sardines contributed to a greater demand for meal and oil produced from menhaden. In 1956 landings of menhaden reached a peak at 2.1 billion pounds. Then

in 1957 the catch declined to 1.7 billion pounds because bad weather restricted fishing operations and fewer menhaden were available. In 1958, bad weather and lack of fish have again limited the catch, and the year's landings were somewhat lower than those in 1957.

Menhaden meal is used in the United States mainly as feed for poultry. Menhaden oil is used mainly as an ingredient of margarine in the Netherlands and West Germany. The margarine producers prefer oil from Gulf-of-Mexico menhaden over oil from Atlantic menhaden. As the menhaden fishery in the Gulf of Mexico expanded, the relative importance of the sales of menhaden oil increased. in 1949, oil accounted for about 15 percent of the value of menhaden products, meal accounted for about 85 percent, and a negligible amount of salted menhaden accounted for less than 1 percent. By 1956 the oil accounted for about 30 percent of the value of menhaden products.

Production of menhaden oil doubled between 1950 and 1956--increasing from 76.6 million pounds to 168.2 million pounds (table 1). Menhaden oil is not classified separately in Bureau of the Census export statistics, but is included in a single category with other inedible fish oils. United States exports of fish oils (mostly menhaden oil to the Netherlands and West Germany) reached a peak in 1956 at 142.2 million pounds; of this total, 114.8 million pounds went to Common Market countries (table 2).

Since 1956 the market for menhaden meal has remained rather stable, but the market for menhaden oil has weakened because of increased competition in the Netherlands and West Germany from other organic oils. The average wholesale price of menhaden oil, f.o.b. Baltimore, declined from approximately $9\frac{1}{2}$ cents a pound to $8\frac{1}{2}$ cents in early 1957, and from $8\frac{1}{2}$ cents to $7\frac{1}{8}$ cents in mid-1958.

MENHADEN OIL COMPETES IN THE EUROPEAN ORGANIC-OIL MARKET

New trade restrictions by Common Market countries could change the channels of trade in United States menhaden oil. In Europe, fish oil is used mainly by margarine and shortening manufacturers. Since menhaden oil produced in the United States is available in large volume at a low price, it has become an established ingredient in the margarine produced in West Germany mainly by one large refining company and in the Netherlands by a similar company. Menhaden oil competes with other organic oils, including herring oil, pilchard (sardine) oil, numerous vegetable oils, whale oil, and the byproduct oils from the meat-packing industry. Generally, menhaden oil sells for at least 10 percent less than whale oil and competitive vegetable oils. Organic oils may be used interchangeably to a large extent, but each oil has chemical properties which tend to channel it toward certain industries. Within the individual industries price plays a major role in determining the proportion of each oil used in a given product. In Europe, the proportion of fish oil in margarine has varied from none to 60 percent, depending on the grade of margarine and on the relative price of fish oil. Common Market countries produce little raw materials for organic oils. They do have a small production of fish oil from the wastes of herring canning plants, but the major supply of fish oil consists of the mehnaden oil obtained from the United States.

The demand for United States menhaden oil slackened somewhat in 1957 and again in 1958 possibly owing to the increased amounts of soybean oil available in Western Europe. When the average wholesale price of menhaden oil dropped to $8\frac{1}{2}$ cents a pound in early 1957, margarine processors in West Germany and Netherlands continued to absorb United States production. The stability of the menhaden oil market in Europe varies according to the following factors: (1) availability of dollar currency, (2) demand for the various grades of margarine, (3) butter production,

(4) world demand for fish meal since fish oil is a byproduct of fish meal, (5) the production of South African pilchard oil, (6) whale-oil production, (7) vegetable-oil and oil-seed production, (8) the relative facilities for and merits of crushing oil seeds in the Common Market area, and (9) new technological advances in oil uses.

COMMON MARKET COUNTRIES MAY INCREASE ORGANIC-OIL PRODUCTION

The Common Market countries may try to develop a large supply of organic oils of their own. The Common Market treaty includes an agriculture-expansion program for increasing production and earnings, stabilizing markets, and guaranteeing supplies of agriculture and fishery products. To accomplish this, the Common Market countries plan to apply import controls and subsidize industries where necessary. Should the Common Market countries increase their production of fish oils, animal oils, or vegetable oils, their requirements for imported menhaden oil will decline. At present most of their organic oils are derived from imported oil seeds. Domestic sources of organic oil are whales, herring wastes, and domestically-grown oil seeds. With the overseas territories of France and Belgium included in the Common Market area, the capacity for raw, organic-oil production in the Common Market will be several times larger. At present, Western Europe imports sizable quantities of palm oil, palm-kernal oil, and other tropical vegetable oils from these overseas territories.

Table 3 - United States Exports of Edible Fishery Products, 1957

Country	Fresh or Frozen			Cured		Canned					Total
	Salmon	Other Fish	Shellfish	Salmon, Salted and Pickled	Other	Salmon	Sardines	Other Fish	Shrimp	Other Shellfish	
	(US$1,000)										
Common Market Countries1/:											
Netherlands	0	19	15	28	0	171	4	0	1	0	238
Belgium-Luxembourg	43	2	12	17	1	59	52	2	49	0	237
France	90	35	15	10	2	3	0	1	3	2	161
West Germany	4	0	3	67	6	0	0	2	5	4	91
Italy	0	0	13	0	1	1	0	9	3	13	40
Belgian Congo	0	0	0	0	0	23	2	40	5	0	70
French Pacific Islands	0	0	0	0	0	2	40	6	0	0	48
French Somaliland	0	0	0	0	0	0	0	1	0	0	1
Total	137	56	58	122	10	259	98	61	66	19	886
Other Countries	310	963	2,379	104	366	4,481	2,681	4,424	2,344	1,613	19,685
Grand Total	447	1,019	2,437	226	376	4,740	2,779	4,485	2,410	1,632	20,551

1/ Includes selected territories.
Source: Bureau of the Census. United States Exports of Domestic and Foreign Merchandise, 1957.

Another factor to be contended with is the duties that will be assessed under the Common Market for competitive vegetable oils. Any new duties placed on fish oils and any duty changes on vegetable oils and oil seeds will be important considerations in the fish-oil market.

RESEARCHERS SEEK NEW USES FOR FISH OILS

In preparation for the possibility that the Netherlands and West Germany may reduce purchases of menhaden oil, United States chemists are studying fish oils to find new uses. Menhaden oil, as well as other fish oils, can be used as an ingredient in over 100 food and industrial products, including soaps, paints, varnishes, leather conditioners, cooking oils, and poultry feeds. But, in many cases, fish oils are less desirable than other organic oils, primarily because they are chemically less stable and more likely to turn rancid. For the past three years, the U. S. Bureau of Commercial Fisheries and other groups have worked to develop new uses for fish oils. One approach would utilize these unstable properties as valuable assets in the manufacture of chemically-modified products. Other work is aimed at improving the stability of the oil.

The most promising development so far appears to be the use of fish-oil constituents for ore collection, by the flotation process. This is a project conducted by the University of Minnesota School of Mines and Metallurgy under a Bureau contract

with funds made available through the Saltonstall-Kennedy Act of 1954. Once the product is perfected, the iron-ore processing industry can use large quantities of menhaden or other fish oil to recover iron from low-grade ores. Years ago the industry used low-cost fish oils to float iron ore away from impurities. Now that the high-grade ore fields in the United States have been depleted, the industry may use fish oils again. But under the proposed process, the fish-oil constituents would be used to float the impurities away from the iron ore.

Meanwhile, other laboratories continue to work on other applications for fish oils and on improved processing techniques. Possible new applications include the use of fish oils in fungicides, insecticides, pharmaceuticals for coronary disease, and heat-resistant paints.

OTHER UNITED STATES FISHERIES LITTLE AFFECTED BY COMMON MARKET

Among the edible fishery products imported by the Common Market countries from the United States are frozen salmon, canned salmon, cured salmon, canned California sardines, and canned shellfish. As far as these products are concerned, the value of United States shipments to Common Market countries in recent years has been small (table 3).

Canned salmon, the second most important fishery product exported by the United States to the Common Market countries, typifies the present insignificant role of United States edible fishery products in the trade of Common Market countries. Before World War II, United States exports of canned salmon to those countries increased from about 1 million pounds in 1935 to about 4 million pounds in 1938. Trade was cut off during World War II. In 1946, when foreign aid programs were strong, the United States shipped about 1 million pounds to the six countries. Following the establishment of the Marshall Plan in 1948, which encouraged greater self-sufficiency in Western Europe, canned salmon exports declined to less than 250,000 pounds. But, as the economy of Europe improved, imports increased to the present rate of about 500,000 pounds a year. Nearly all canned salmon shipped to the Common Market countries from the United States is imported by the Benelux countries free of duty. For many years shipments of canned salmon to Common Market countries have accounted for less than 1 percent of United States production. Currently, the United States accounts for less than 10 percent of total imports of canned salmon by Common Market countries.

The present tariff rates on canned salmon in the Common Market countries are as follows: In the Benelux countries, the official duty of 15 percent ad valorem has been temporarily suspended; Italy has a 10 percent ad valorem duty; Germany, 20 percent; and France, 20 percent. The principal territory that imports canned salmon, the Belgian Congo, has a duty of 15 percent and an import sales tax of 5 percent of the duty-paid value. Belgium and Luxembourg have a sales tax of 5 percent. Italy has a sales tax of 3 percent, and France has an import tax of 30 percent and a stamp tax of 3 percent of the import duty and import tax. The Governments of France and Italy restrict canned-salmon imports by permitting only small quantities to be received by holders of government-issued import licenses. Until early 1957, West Germany also had import-license restrictions on canned salmon.

The Common Market tariff on canned salmon will be $12\frac{1}{2}$ percent ad valorem if based on the arithmetical average of actual duties of January 1, 1957. If based on an arithmetical average of official tariff rates, it will be $17\frac{1}{2}$ percent ad valorem, or about 27 percent if based on aggregate import fees. At the GATT conference at Geneva in 1956 the official tariff in Benelux countries was reduced from 20 percent to 15 percent in a concession granted to the United States. At the same conference Italy granted a concession to Canada on canned salmon, reducing the duty to 14 percent.

If the GATT members should hold Common Market countries to previous commitments, the Common Market may not set the tariff above 14 percent without granting a compensatory concession.

The United States exports a number of other fishery products to the Common Market countries--mainly to the Benelux countries where liberal trade policies now prevail. But except for the menhaden industry and a few food-specialty processors, the volume of trade is so small that changes in the import duties, taxes, or quotas of the Common Market countries should have little direct effect on the United States fishery industries at their current levels of production.

If the Common Market countries successfully expand their economy they may develop a greater buying capacity for dollar goods, and thereby be able to import a larger volume of United States fishery products. At present, the concern of most United States fishery producers is to supply and maintain the markets that they have already developed in those countries.

EFFECT OF COMMON MARKET ON NETHERLANDS IMPORTATION OF MENHADEN OIL

The Netherlands Ministry of Finance has confirmed that at present menhaden oil imports may enter the Netherlands free of duty and will continue to be allowed free entrance for at least four years after the Common Market Treaty has become effective, that is up to January 1, 1962. Thereafter the status is still uncertain, but the Benelux countries have urged the full inclusion of this oil in the free list.

Menhaden oil is at present included in item 103 of the Benelux import duty tariff "Fats and oils of fish and sea animals, whether or not refined" and accordingly free. Under the common market tariff item 15.04 bears exactly the same commodity definition, but has been split into two sub-items, raw and refined fish oils (according to Common Market definition fish oil is considered as refined when it contains more than 50 percent free fatty acids measured by weight). The raw will continue to be free, the refined will finally be subject to a 3-percent import duty, to be imposed in three steps of 1 percent each. Accordingly, the import duty on refined menhaden oil will be 1 percent on January 1, 1962, 2 percent on January 1, 1966, and 3 percent on January 1, 1970.

The Netherlands Government has proposed to exempt all refined fish oils, except cod-liver oil, but it is not certain that this proposal will be accepted by the other Common Market countries, expecially Germany. At present Germany levies a 4-percent duty on refined menhaden oil, which will have to come down to 3 percent after the integration of Common Market tariffs has been completed, unless the Netherlands proposal for full exemption is accepted.

Whatever the final duty may be under the Common Market Treaty, it will apply equally to imports of menhaden oil into the Netherlands, Germany, and/or the other four Common Market countries. One of the principal provisions of the Common Market Treaty is that all member countries will have equal import duties toward outside countries after the final provisions of the treaty have been effected. (United States Embassy, The Hague, report dated December 18, 1958.)

RESEARCH
IN SERVICE LABORATORIES

TECHNICAL NOTE NO. 49 - MEASUREMENT OF RANCIDITY IN FISHERY PRODUCTS BY 2-THIOBARBITURIC ACID METHOD

ABSTRACT

This short study of rancidity in frozen herring indicated that TBA values give some correlation with organoleptic tests.

INTRODUCTION

Measurements of rancidity in fishery products recently have been enlarged from organoleptic, peroxide, and carbonyl methods to include the 2-thiobarbituric acid (TBA) method (Yu and Sinnhuber 1957). The purpose of the present study was to compare this new method with organoleptic tests.

PROCEDURE

GENERAL: In designing this experiment, we thought it desirable to compare the TBA and organoleptic tests by using fish that were becoming rancid under two conditions: one not favoring the development of rancidity and the other somewhat favoring the development, so that a small but definite difference would exist in the two groups. It is known that fish frozen in blocks and heavily glazed with ice are somewhat more resistant to rancidity than are fish frozen in evacuated polyethylene bags. (Polyethylene has an unusually high permeability to oxygen among materials commonly used to package frozen foods.) Advantage was taken of this fact.

The general procedure of the experiment was to allow the fish to become rancid under the two conditions and periodically to determine the extent of rancidity in both groups by means of the organoleptic test and the TBA test. Herring was the experimental fish used because of its high fat content, tendency to become rancid, and availability at the time the experiment was started.

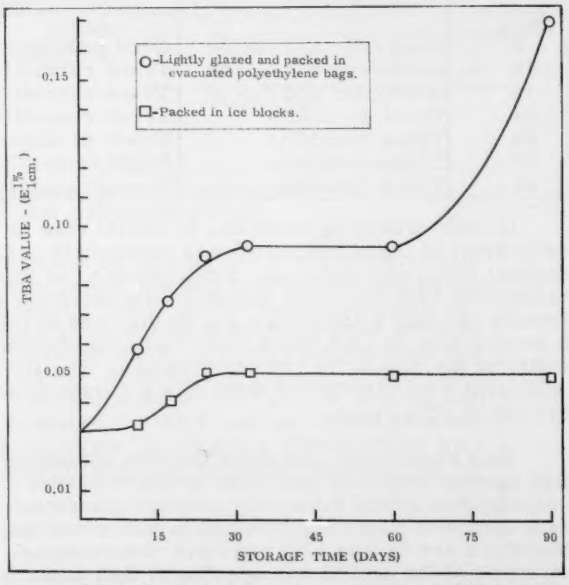

Fig. 1 - Effect of method of packaging on rancidity of whole herring held at 0° F.

SPECIFIC: From Anacortes, Wash., 100 medium-to-large day-old herring were procured. At the laboratory they were cleaned and randomly divided into two groups. One group consisted of lots of five fish that were lightly ice-glazed and sealed in evacuated polyethylene bags; the second group consisted of lots of five fish frozen in blocks of tap water. The two groups then were stored side by side at 0° F.

On the day of examination, one bag of each of the two groups was removed from storage, thawed, and filleted. The right fillet of each fish was prepared for organoleptic examination by being baked in foil. The left fillet of each fish was carefully skinned and boned in preparation for the TBA measurement. Five fillets were blended with their weight of water (1:1 dilution) in a pint jar, and 1.9 to 2.1 grams of the homogenate was removed by means of a large-tip pipette and weighed into a tared 250-milliliter round-bottom flask. The remainder of the procedure followed exactly that described by Yu and Sinnhuber except that it was found desirable to store the TBA solution in a refrigerator and to mix it in the solution of citrate buffer used, just prior to adding it to the sample.

The red color that develops when the TBA reagent is refluxed with the sample of fish was measured at 535 millimicron on a Beckman DU spectrophotometer, the value being reported in terms of $E^{1\%}_{1cm.}$.

RESULTS

The data showing the effect of the two methods of packaging on TBA value of herring held at 0° F. are given in figure 1. The fillets from the two groups were compared and scored for odor and taste immediately after removal from the oven. Results are given in table 1.

Table 1 - Organoleptic Rating of Frozen Herring Stored at 0° F.

Storage	Organoleptic Rating	
	Herring Stored in Ice Blocks	Herring Stored in Polyethylene Bags
Days		
0	Good odor and flavor	Good odor and flavor
12	Good odor and flavor	Trace rancidity
16	Good odor and flavor	Trace rancidity
24	Trace rancidity	Trace rancidity
33	Trace rancidity	Trace to slight rancidity
60	Trace rancidity	Slight rancidity
90	Trace rancidity	Strong rancidity

In this experiment, trace rancidity, as determined organoleptically, was first evident at a TBA value of 0.05 ($E^{1\%}_{1cm.}$). A later stage of rancidity, which can be described as "slightly rancid," occurred at a value of 0.10. Extreme rancidity occurred at 0.17.

In both packaging methods, an initial rise in TBA value (corresponding to development of trace rancidity) was followed by a period in which the TBA value remained relatively constant. Unfortunately, in this intermediate stage of slight rancidity, the TBA test gave somewhat inconsistent and overlapping values (compare results in table 1 and figure 1). In the case of the polyethylene-wrapped samples, a second rise in TBA value occurred corresponding to development of extreme rancidity at the end of the induction period. The ice-glazed samples had not developed sufficient rancidity by the time this experiment was ended to show this second increase in TBA value.

This experiment indicates the high efficiency of an ice glaze to protect frozen fish against rancidity and, also in confirmation of previous findings, suggests that polyethylene offers relatively inferior protection against entrance of oxygen into packages of frozen food wrapped in this material. The findings in this experiment therefore are in line with previous observations. Nevertheless, owing to the restriction of the test to one species of fish under one set of conditions, we are not necessarily implying that similar correlation would be obtained if conditions were varied.

Since the start of the tests reported here, Sinnhuber and Yu (1958) have suggested an alternate method of reporting TBA values in terms of equivalent malonaldehyde content of the sample. If our data are expressed in terms of this new TBA number (milligrams of malonaldehyde per 1,000 grams of sample), 2.3 is obtained for trace rancidity, 4.6 for slight rancidity, and 7.8 for extreme rancidity.

CONCLUSIONS

1. In the present single series of storage tests at 0° F. with herring lightly glazed and sealed in evacuated polyethylene bags or frozen in blocks of tap water, the 2-thiobarbituric acid (TBA) test for rancidity correlated with the organoleptic test.

2. When the data obtained were expressed at TBA values ($E^{1\%}_{1cm.}$), 0.05 was obtained for trace rancidity, 0.10 for slight rancidity, and 0.17 for extreme rancidity.

3. When the data were expressed in terms of milligrams of malonaldehyde per 1,000 grams of sample, 2.3 milligrams was obtained for trace rancidity, 4.6 milligrams for slight rancidity, and 7.8 milligrams for extreme rancidity.

4. Owing to the restriction of the test to one species of fish under one set of conditions, a similar correlation of TBA value with organoleptic test would not necessarily be obtained if the conditions were varied.

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TREATING SALMON WITH NITRITE DIP FOR BETTER PRESERVATION

Treatment of salmon with nitrite by dipping for 2 to 3 minutes in a 0.2-percent solution of the preservative showed slight improvement in the keeping quality of the iced fish. The 5-minute dipped samples developed brownish black discoloration during 2 weeks of iced storage. The pink color of the gills disappeared more quickly than normal and there were spots of strong rancidity. After frozen storage of untreated and nitrite-dipped salmon for 7 or 8 months at -20° C. (-4° F.), no bad effect of a 2-minute dip could be shown but the 5 minute dipped samples resulted in serious quality deterioration including discoloration and rancidity (Arsberetning fra Fiskeriminsteriets Forsogslaboratorium for 1957, Copenhagen, Denmark).

Alaska

SEA AND LAND AREAS SURVEYED FOR NEW MAPS AND CHARTS: The unheralded arrival of five ships in Seattle, Wash., in October 1958 marked the completion of six months work of gathering information on the icy waters which fringe the shores of Alaska. The Director of the Coast and Geodetic Survey, U.S. Department of Commerce, announced November 23, 1958, that the information on the northern waters would soon be converted into charts and maps for the future development and defense of our 49th State.

Probably no other place on earth has a greater need for modern maps and charts. Alaska, covering 586,400 square miles, has little more than 4,000 miles of highways and one railroad. Its commerce depends almost entirely upon water and air transportation. The familiar bush-pilot plane and interisland steamer are as common in Alaska as taxis and buses in older states.

During the past six months these five ships, equipped with sonic-sounding gear, and electronic navigation and surveying instruments have succeeded in obtaining information covering 1,500 square miles of fog-shrouded water. The ships operating as individual units filled in gaps from southeast Alaska to Atka Island, far out in the Aleutian chain.

The survey ships, which left their home port of Seattle last April, were: the Pathfinder, the Explorer, the Lester Jones, the Hodgson, and the Patton.

This year's surveys, which plumbed the depths around such places as Kasaan Bay, Clarence Strait, Sumner Strait, north shore of the Alaskan peninsula, Soda Bay, Dutch Harbor, and barren Atka Island, were a far cry from the meager beginning of the monumental task that was undertaken in 1867 while negotiations for the purchase of Alaska were still under way.

Operations have been extensive enough to survey almost 500,000 square miles of ocean, to produce more than 200 nautical and aeronautical charts covering the area, thousands of miles of geodetic surveys, and volumes of related information on tides, currents, magnetism, gravity, and special earthquake studies.

Not all operations were confined to the sea. In many cases landing parties were put ashore on the volcanic islands of the Aleutians to establish permanent geodetic control points for the offshore surveys. Thousands of similar points already had been established in the interior of Alaska by accurate geodetic surveys which allow for the curvature of the earth in determining the geographic positions needed for the preparation of large-scale topographic maps.

Most of the field surveys are preceeded by aerial photography that is done with a special 9-lens aerial camera flown in a U. S. Coast Guard aircraft as a joint Coast and Geodetic Survey-Coast Guard project. The 9-lens camera was designed for this specific task and provides much greater coverage per photograph than a single lens camera. These photographs are then used to map the land information needed on nautical and aeronautical charts. This unique photographic mission has photographed thousands of square miles of coastline in recent years and maps have been made of most of the coastline of arctic and western Alaska and of the western Aleutians.

Although the survey has come a long way since 1867, there still remains more than one-half million square miles of water composed of the Pacific Ocean, Bering Sea, and Arctic Ocean that are unsurveyed or inadequately surveyed by Coast and Geodetic Survey standards.

The present program of the Coast and Geodetic Survey in Alaska will be carried on to promote the commercial and industrial potential of Alaska. Future economic developments of the State of Alaska depends on accurate comprehensive surveys of all Alaskan waters and the 34,000-mile tidal coastline.

California

AERIAL CENSUS OF COMMERCIAL AND SPORT FISHING CONTINUED (Airplane Spotting Flight 58-18): The inshore area between Monterey and the Russian River was surveyed from the air (October 10-14, 1958) by the California Department of Fish and Game Cessna 3632C to determine the distribution and abundance of pelagic fish schools, sport fishermen, abalone pickers, and clammers within the boundaries of the area surveyed. The entire area was covered each day for shore fishermen and on two of the days a census was made of clammers and abalone pickers. Pelagic fish could not be spotted on October 11 and 12 due to fog. On both October 12 and 13, two separate counts of shore fishermen were made over a portion of the area. It was hoped a tally of clammers and abalone pickers could be made on October 14, but the low tide proved to be too late in the day for successful aerial observation.

Pelagic Fish: Fewer anchovy schools were seen on this flight than on any flight since April 1958. The largest concentrations were off Drakes Bay and Santa Cruz. Most of the schools were in deeper water farther from shore than previously noted this year. No schools of sardines or mackerel were observed.

Clammers and Abalone Pickers: The low tides on October 12 and 13 were ideal for clammers and abalone pickers. A coverage of the coast from Monterey to the Russian River was made on Octo-

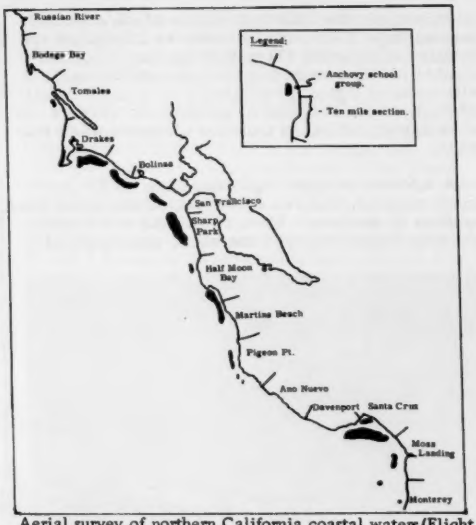
ber 12 and the area from Monterey to San Francisco was covered on October 13.

The largest concentrations of clammers were in Monterey Bay where 849 in quest of pismo clams were tallied. Most of them were at Moss Landing and Sunset Beach State Park. The 64 ocean clammers at Bolinas were seeking littleneck clams north of the jetty on the ocean side. The 48 clammers at Tomales and 60 at Bodega were digging on the mud flats inside the bays.

Over 200 abalone pickers were tallied on October 12 in the area from Monterey to the Russian River--69 at Pigeon Pt. and 50 at Montara.

Shore Fishermen: Two flights were made daily on October 12 and 13 over a portion of the coast where a striped bass "run" had attracted large numbers of shore casters to the beaches. One tally was made during high tide and the other during low tide.

Fewer shore fishermen were tallied during the low tide; however, the number of rock fishermen did not decrease as much as the number of surf fishermen. In fact, on October 12, the number of rock fishermen increased during the low tide period at Santa Cruz and at Pigeon Pt.



Aerial survey of northern California coastal waters (Flight Report 58-18, October 10-14, 1958.)

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SALMON CATCH LOWER BUT SPAWNING HIGHER IN 1958: Catches of salmon in 1958 by California commercial and sports fishermen were down over previous years, but there were more spawning-bound salmon in the rivers than in the last two years. The California Department of Fish and Game said the spawning report is based on preliminary observations obtained from a spawning-bed census.

The lack of rain, resulting in low flows in many streams, prevented entry of salmon into the smaller tributaries. Spawning activity was moderate, but rain was needed to bring the salmon upstream and enable them to overcome barriers made impossible by the day weather.

Preliminary figures show commercial troll landings in 1958 will be less than 4 million pounds, the lowest since 1941 when just under 3 million pounds were landed. Average landings from 1941-1957 were a little more than 6 million pounds. The average since 1916 was about 5.5 million pounds, about the same total as the 1957 landings.

Sports fishing party boats reported 43,100 fish through September 1958 as compared to 44,300 for the first 9 months of 1957, and a total catch in 1957 of 44,700 fish.

The commercial salmon trolling season closed September 15, 1958, and sport fishing closed on November 16 in ocean waters and bays south of Tomales Point, except for bays in the Sacramento-San Joaquin Rivers east of Carquinez Bridge. (California Department of Fish and Game press release, November 28, 1958.)

* * * * *

SARDINE POPULATION SURVEY OFF COAST OF CENTRAL BAJA CALIFORNIA (M/V Alaska Cruise 58-A-5): The inshore area off central Baja California from Santa Maria Bay northward to Pt. Canoas was surveyed by the California Department of Fish and Game's research vessel Alaska on September 4-22, 1958. The objectives were: (1) to collect samples of the fall spawning and the spring spawning groups of sardines from central Baja California for detailed subpopulation studies;

(2) to sample the 1958 year-class of sardines off central Baja California in order to determine its relative abundance; (3) to test the new modified blanket net as a sampling tool; to conduct tests with colored lights, preliminary to a more detailed study of the reaction of sardines to various colored lights; and (4) to troll for albacore when feasible.

A 1,500-watt night light was used on 27 (one-hour) stations, and two 1,500-watt night lights were used on 31 stations. When two lights were used, one was suspended over the water amidships on

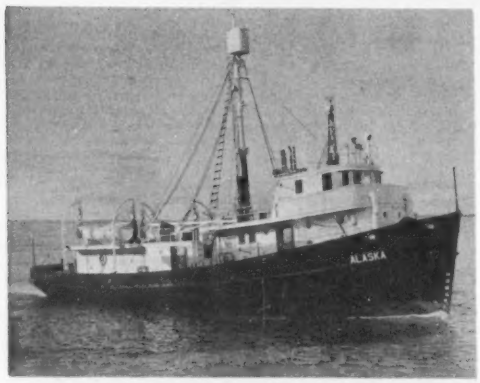


Fig. 1 - California Department of Fish Game's research vessel M/V Alaska.

the starboard side and the other placed near the stern, also on the starboard side. Both lights were illuminated for one hour, whereupon the after light was extinguished and the forward light dimmed. The blanket net was then set promptly.

Samples were obtained of at least one of the four pelagic species--sardines, Pacific mackerel, jack mackerel, and anchovies--on 24, or 41 percent, of the stations. Sardines were sampled at 20 stations (34 percent), anchovies at 8 (14 percent), Pacific mackerel at 9 (16 percent), and jack mackerel at 3 (5 percent).

Seven samples of postlarval sardines resulting from the 1958 fall spawning and 7 samples of juvenile sardines resulting from spawning in the spring of 1958 were obtained. In addition, 8 samples of adult sardines and 1 sample of very small juveniles from 65-75 mm. in length were collected.

Young sardines resulting from spawning in the spring of 1958 appear to have had a moderately successful survival off central Baja California. Fish born in 1957, which were abundant off Southern California in the summer and fall of 1957, and which are contributing heavily to the present California commercial sardine fishery, were not noticeably abundant off central Baja California. Thus it would appear that the 1957 year-class was primarily of a northern origin and the 1958 year-class may be somewhat weaker and of a more sourtherly origin.

Postlarval sardines from spawning in the fall of 1958 were more abundant in the areas in which the U. S. Bureau of Commercial Fisheries South Pacific Fishery Investigations found the heaviest concentrations of sardine eggs one month earlier. This is the area south of Cedros Island and in the lower portion of Sebastian Viscaino Bay.

Although sardines were sampled frequently throughout the surveyed area, it was felt that the increased efficiency of the new blanket net rather than an increase in the sardine population was responsible for the high number of samples. The new net was similar to the Bevington Blanket described by Radovich and Gibbs in California Fish and Game (vol. 40, no. 4). Besides being larger and deeper the new net was made of finer-gauge black-marlon

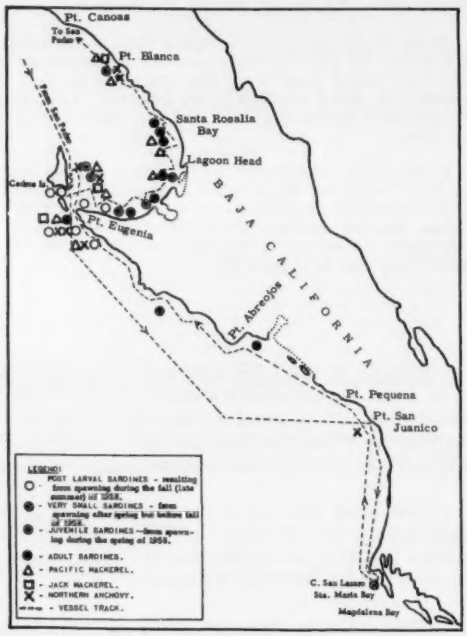


Fig. 2 - M/V Alaska cruise 58-A-5 (September 4-22, 1958).

webbing. All of the manila lines used in the construction and operation of the net were also dyed black. The black net absorbed light, making it practically invisible when viewed from above the surface of the water. From observations of the reactions of fish to the black net it seemed that they did not see it either. On many occasions sardines and other pelagic fish, actively feeding on the surface, continued to feed without any visible fright reactions after being completely impounded by the net. Fish were captured at every station at which they were present under the light at the time the net was set.

Larger pelagic fishes such as bonito, sierra, yellowtail, and barracuda were caught with ease. On many occasions these larger species were observed swimming headlong into the webbing from the outside after the net was set.

Various colored lights were tested to determine the intensity of light at different distances from the

light source. On one occasion a school of fish, mostly anchovies, attracted to white light was subjected to a red underwater light and the white light was extinguished. The illuminated area around the red light appeared spherical and was about 10 feet in diameter. The school of anchovies became very densely compacted into a ball within the spherical illuminated zone and remained in this position until daybreak, approximately an hour, when they disappeared. During the time the fish were under the red light a shark approached to within 3 feet of the lamp without the school showing any apparent reaction.

It is felt that the present blanket net will sample pelagic fish adequately provided they are attracted to the light. Further investigation is needed to determine the optimum light colors and intensities for attracting each of the pelagic species under a variety of oceanic conditions.

Sea-surface temperatures in the area surveyed ranged from 20.6° C. (69.1° F.) one-half mile east of Blanca Bay to 27.8° C. (82.0° F.) four miles southeast of Cape San Lazaro. This was between 2° and 3° C. warmer than the 1949-55 September average in the same area.

The Pacific Marine Fisheries Commission has asked that vessels engaged in California Cooperative Oceanographic Fishery Investigations cruises troll for albacore whenever feasible, and lines were put out during daylight hours when the vessel was under way. No albacore were caught. Seven dolphin, seven yellowfin tuna, one skipjack, one black skipjack, and four sierra were taken on September 7, 8, and 9 between Abreojos and Santa Maria Bay.

Approximately 2,000 live sardines were delivered to San Diego Harbor for the South Pacific Fishery Investigations and numerous samples of barracuda, black sea bass, and other species were collected for futher studies ashore. In addition, several live specimens were transported by truck to the Steinhart Aquarium, San Francisco, and to the Marineland of the Pacific.

Canned Tuna, Salmon, and Sardines Purchasing Patterns Under Study

A marketing study to point up consumer purchasing patterns for canned tuna, salmon, and sardines was started on November 6, 1958.

The study is being made by the Market Research Corporation of America, of New York City, under a contract with the U. S. Bureau of Commercial Fisheries for $43,200. The money is provided by the Saltonstall-Kennedy Act of 1954.

Data will be gathered on a nationwide basis over a period of one year. Results will be made available monthly to the fishing industry and to other interested individuals, firms, or associations. The monthly releases will be followed by an annual report containing a general summation of the monthly findings plus considerable data relative to market concentration, purchases in relation to size of the family, family income, age and employment status of the housewife, and other market information.

The data will be based upon weekly diaries of a national panel of 6,000 families which will record their purchases of a selected list of products. The monthly reports will show the number of standard cases of each type or variety of canned tuna, salmon, and sardine purchased; the number and percentage of families buying each variety or type; the average purchase; the average price paid; the type of store where purchased; and other pertinent data.

Cans--Shipments for Fishery Products, January-September 1958

Total shipments of metal cans during January-September 1958 amounted to 94,283 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 94,888 tons in the first nine months of 1957. Fish canning in September for salmon and

Maine sardines was declining, but tuna and California sardine packing was at a high level.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor: 23.0 base boxes of steel equal one short ton of steel.

Columbia River Basin

INTERIOR DEPARTMENT URGES FURTHER FISHERY STUDIES FOR PROPOSED SNAKE RIVER DAM: No additional dam construction on the Middle Snake River below the mouth of the Imnaha River should be considered until the possibilities of providing additional water storage elsewhere have been fully explored, stated the Secretary of the Interior on October 29, 1958.

The Secretary of the Interior in a letter to the Secretary of the Army pointed out that the Middle Snake River Basin, up to and including the watershed of the Imnaha River, an Oregon tributary, is the key remaining Columbia River Basin area for anadromous fish. The letter stressed the problem of passing anadromous fish over high dams, both upstream and downstream.

He pointed out that the U. S. Department of the Interior, with help from the U. S. Corps of Engineers, has been advancing biological and engineering research on this matter; that while considerable progress has been made there remains much to learn before the problem can be successfully met; that even after solving the fish-passage problem there remains the loss of spawning and rearing areas as a result of flooding by the reservoirs.

The letter was based upon an understanding that the Corps of Engineers is presently considering a number of dams on the Middle Snake River below the confluence of the Imnaha, an area which the Interior Department regards as essential to the Columbia River fisheries and one which the Nation can not afford to sacrifice at this time.

Preliminary studies by Interior's Bureau of Reclamation show that there are storage sites above the Imnaha of considerable potential which can be developed now. These reservoirs, taken together with other projects in the general area which can be undertaken after the fish-passage problem is satisfactorily solved, will meet the objective of full comprehensive development.

The Secretary of the Interior recommended that the Department of the Army join with Interior in the adoption of a firm policy of "orienting our planning for the undoubted water-control needs of the Pacific Northwest" to areas other than this critical portion of the Middle Snake River unless specifically required by the Congress, until "we can be sure we will not needlessly harm the vital fishery resources," for "once this resource is destroyed it will be difficult if not impossible to restore it for a particular stream or river basin" even with future development of satisfactory fish-passage facilities.

Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-OCTOBER 1958: Fresh and Frozen Fishery Products: For the use of the Armed Forces under the Department of Defense, 1.5 million pounds (value $855,000) of fresh and frozen fishery products were purchased in October 1958 by the Military Subsistence Market Centers. This amount was 9.2 percent less than the purchases made in September and 6.3 percent under the purchases of October 1957. However, the value of the purchases in October 1958 was up about 5.7 percent from October 1957.

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Market Centers, October 1958 with Comparisons

QUANTITY				VALUE			
October		Jan.-Oct.		October		Jan.-Oct.	
1958	1957	1958	1957	1958	1957	1958	1957
(1,000 Lbs.)				($1,000)			
1.5	1.6	19.4	20.3	855	809	1/	10.5

1/Not available.

For the first 10 months of 1958 purchases totaled 19.4 million pounds, a decrease of 4.6 percent from the 20.3 million pounds purchased in the same period of 1957.

Prices paid for fresh and frozen fishery products by the Department of Defense in October 1958 averaged 56.7 cents a pound, or 6.4 cents more than the October 1957 average of 50.3 cents a pound.

Part of this increase was due to the higher prices that prevailed in October 1958 and partly to purchases of more expensive fishery products like shrimp and scallops.

Table 2 - Canned Fishery Products Purchased by Military Subsistence Market Centers, October 1958 with Comparisons

Product	QUANTITY				VALUE
	October		Jan.-Oct.		October
	1958	1957	1958	1957	1958
	. . . .	(1,000	Lbs.)		($1,000)
Tuna	-	406	3,931	1,882	-
Salmon . .	1,381	1,056	2,783	2,276	761
Sardine . .	-	-	93	125	-

1/Values unavailable.

Canned Fishery Products: Salmon was the only canned fishery product purchased for the use of the Armed Forces in October 1958. Total purchases of canned tuna, salmon, and sardines for the first ten months of 1958 amounted to 6.8 million pounds--about 58.1 percent more than the 4.3 million pounds in the same period of 1957.

Note: Armed Forces installations generally made some local purchases not included in the data given; actual total purchases are higher than indicated, because it is not possible to obtain local purchases.

Florida

FISHERIES RESEARCH: The Marine Laboratory of the University of Miami carries on research on fisheries with funds provided by the Florida State Board of Conservation, the U. S. Fish and Wildlife Service, and private sources. The research of interest to commercial fisheries contained in the Laboratory's October 1958 Salt Water Fisheries Newsletter follows:

Sea Trout Tagging: The softness of the sea trout makes it hard to tag successfully with any kind of outside tag.

The solution reached several years ago on the middle Atlantic coast is to make a small cut in the belly of the trout and slip in a bright-colored plastic tag. Fishermen cleaning their catch find these inside tags and return them. One great difficulty is in getting the tags back, since many are missed, or at least are not noticed until it is too late to get good data on where and when the fish was caught.

A total of 575 tags were put in spotted sea trout on the Florida west coast in July, August, and September 1958. Most of these--374 tags--were inserted in the fish at Cedar Key and the remaining 201 at Fort Myers. The tags used in the present experiment are green in color. One side bears a number and the other side instructions for their return.

Shrimp Tagging: A total of 2,180 pink shrimp were tagged in the third quarter of 1958. The tagging was done on the Tortugas grounds in South Florida, from regular commercial trawlers.

Earlier taggings of shrimp on Tortugas resulted in an average return of about 25 percent. This is exceptionally high, and the latest returns (those from July and August taggings) have only been around 2 percent. It seems likely that reduced fishing effort, which occurs every summer, is a major reason for this decline in tag returns. Perhaps increased eating of tagged shrimp by fish is another reason, since it was noticed in some of the summer taggings that little tuna were eating many shrimp as they were tagged and released.

Since the shrimp sheds its shell frequently, the tag must be designed to hold in the muscle while allowing the carapace to split off. None of the commonly used tags is completely satisfactory, but the Petersen tag, consisting of two small plastic discs fastened by a nickel pin, is the one used. Despite its relatively good results with adult shrimp, it is not useful for small shrimp, being apparently too heavy. "Biological" stains, which color the gills of the shrimp but do not harm them, are being tested as a substitute by the U. S. Fish and Wildlife Service.

Artificial Crab Bait: The project to develop an "artificial" crab bait is continuing. Field experiments conducted last year with a wide variety of baits made from fish oils, fish meal, and various chemicals were unsuccessful, so a new approach is being tested. Instead of setting traps with the experimental baits, crabs are being placed in a salt-water tank containing two standard commercial traps. These are baited with the test substances and the attraction of the baits is measured in terms of the number of crabs caught in each trap. So far no bait has been shown to be equal in effectiveness to the fish now used as bait by crab fishermen.

Note: Also see Commercial Fisheries Review, September 1958, p. 36.

Fur Seals

PRICES HIGHER FOR ALASKA FUR-SEAL SKINS AT FALL AUCTION: At the semi-annual sale of Alaska fur-seal skins held in St. Louis on October 17, 1958, 20,900 dressed and dyed Alaska fur-seal skins brought $1,876,000 for the account of the United States Government. The skins are products of the scaling operations of the U. S. Bureau of Commercial Fisheries on the Pribilof Islands.

Corbatch Rookery, St. Paul Island, Alaska. Several harems at season when harems are well knit, before pups start to move out in large numbers.

Fur-seal skins offered at this auction were 4,500 skins less than the number sold at the spring auction held on June 7, 1958, but due to the higher prices bid for the skins the total value was higher by 3.7 percent.

The black-dyed skins sold at the fall auction averaged $92.70 per skin, dark-brown (Matara) averaged $80.12, and the dark shade Kitovi averaged $88.54. Comparable prices for the spring auction were: black-dyed, $81.04; Matara, $67.84; and Kitovi, $64.26.

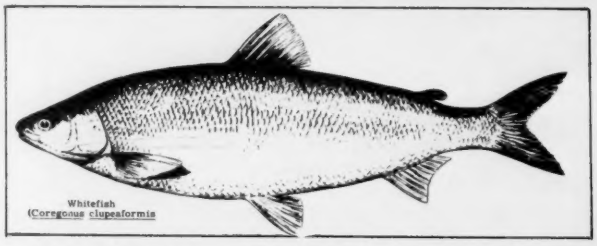
Note: Also see Commercial Fisheries Review, July 1958, p. 27.

Great Lakes

LAKE TROUT AND WHITEFISH MARKETS AT CHICAGO: Lake trout and whitefish comprise two of the more valuable and prized species from the Great Lakes commercial fishery. At the present time the United States Great Lakes fishery for these species provides only a very small percentage of the supplies demanded by Midwestern consumers who place them at the top of preferred lake fish varieties. United States Great Lakes catches of lake trout and whitefish have decreased steadily since 1951--the 1957 whitefish catch was only 51 percent and lake trout 40 percent of the 1951 yield. Whitefish catches in all of the Great Lakes have been low, but it is not known how much of the blame can be placed on the sea lamprey as whitefish are subject to random fluctuations.


Lake Trout
(Christivomer namaycush)

Fresh and frozen whitefish receipts at Chicago in 1957 totaled more than 8 million pounds--86 percent Canada-produced fish and only 14 percent from United States Great Lakes production. Chicago's 1958 whitefish receipts were especially heavy during June-September when close to one million pounds was reported for each month. The September 1958 whitefish receipts of one million pounds included 0.9 million pounds fresh whitefish, principally from Alberta and Manitoba shipping points, and less than 0.1 million pounds from the United States Great Lakes fishery.


Whitefish
(Coregonus clupeaformis

The 1958 lake trout receipts at Chicago followed about the same pattern, also reaching a high point in September when 0.7 million pounds of fresh and frozen lake trout (predominantly Canadian fish) was reported for the account of Chicago dealers.

The 1957 United States Great Lakes whitefish catch of only 1.4 million pounds brought out a number of significant changes in the catch pattern of several of the Lakes regarded as important producers. The pattern in Lake Erie indicated a small but gradual increase for several years and in 1957 landings from that Lake increased 69 percent from the previous year. This catch trend was reversed in Lake Superior--a steady decline since 1954 with a sharp 41 percent drop in the 1957 catch as compared with 1956. The 1957 whitefish yield was almost negligible in each of the other Great Lakes, dropping to a mere 33,000 pounds in Lake Michigan as compared with a catch of more than one million pounds in 1953.

The lower 1957 lake trout catch was no surprise because of greater sea lamprey infiltration in Lake Superior--the last and only stronghold of the Great Lakes lake trout fishery. The operation of electrical sea lamprey control devices was continued in 1958. More recent developments in sea lamprey control have been the experimental application of selective larvicides to streams and tributaries where lampreys spawn. These have been reported as outstandingly successful and hold promise of a highly effective control program. This could develop a more productive Lake Superior trout fishery and possibly re-establish lake trout in Lakes Michigan and Huron.

The closed season of the United States Great Lakes commercial fishery for these species invariably creates a supply shortage and higher prices at the Chicago

Wholesale Market. The closed season for taking lake trout during October was followed by a closed whitefish season in November at most Great Lakes areas. The whitefish scarcity at Chicago during November of 1958 was more pronounced because of the virtual halt in large-scale whitefish supplies from Canada's northern lakes. The Chicago Wholesale Market relies heavily on supplies from points as far north as Great Slave Lake in the Northwest Territories, from Lesser Slave Lake in Alberta, and numerous smaller lakes scattered throughout the Provinces of Saskatchewan and Manitoba.

Iced domestic and Canadian fresh-water fish stacked up inside a wholesale fish house in the Chicago Fulton Market area.

Fresh whitefish supplies at Chicago during November 1958 were very light. Deliveries of Lake Superior whitefish were only a trickle from Ontario and Minnesota producers. Supplies were limited from the International Lakes region, and spotty fishing operations at some of Canada's northern lakes before the start of winter fishing also contributed to firm markets and high whitefish wholesale prices. There was no fall fishing season at Red Lake in 1958 where the whitefish catch is sizable during the short period of operations.

As a contrast, the November 1957 closed season for taking whitefish at Great Lakes areas did not impose any supply hardship during that period. Fresh whitefish supplies flooded the Chicago market from Minnesota and Canadian Lake Superior shipping points. Market supplies were also supplemented by deliveries from Minnesota's Red Lake, the International Lakes region, and from Alberta's Pigeon Lake. A seriously oversupplied market in November 1957 caused sharp price declines, particularly for the Minnesota and Canadian varieties that were marketed at low prices.

Great Slave Lake (Chicago's foremost supplier of lake trout and whitefish covers an area of over 11,000 square miles and is the deepest lake on the North American continent) is the Continent's largest producer of lake trout and whitefish combined. This Lake is reported to support the only known large fresh-water commercial fishery studied from its inception in 1945 and regulated according to scientific findings. Informed fishery observers believe Great Slave Lake will continue for years as a producer of about 9 million pounds of fresh-water fish annually--principally lake trout and whitefish.

--By G. A. Albano, Supervisory Market News Reporter,
Market News Service,
Division of Industrial Research and Services,
U. S. Bureau of Commercial Fisheries, Chicago, Ill.

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LAMPRICIDE TESTING EXTENDED TO CANADA: The lampricide testing program of the U. S. Bureau of Commercial Fisheries in the Great Lakes was extended in the summer of 1958 to Canada when Canadian scientists treated the Pancake River, which enters Lake Superior about 50 miles north of Sault Ste. Marie, Ontario,

with the lampricide. As has been the case when used in streams of the United States, the lampricide (trifluromethyl nitrophenol) performed well by killing sea lamprey larvae. In the Pancake River test 30,000 dead lamprey larvae were collected. The lamprey kill in the treated portion of the river was believed to be practically 100 percent.

Great Lakes Fisheries Exploration and Gear Research

NEW PROGRAM FOR GREAT LAKES STARTED: The U. S. Bureau of Commercial Fisheries Great Lakes Fisheries Exploration and Gear Research program was established in April 1958 with headquarters at Ann Arbor, Mich., to assist the commercial fisheries of the entire region.

The first project to be started by this program was begun in Lake Erie, in cooperation with the Ohio Division of Wildlife and the Ohio Commercial Fishermen's Association. Technical advice and assistance is being given by Bureau of Commercial Fisheries fishing gear specialists to fishermen who are conducting experimental trawling operations for smelt. This fish is not sought by United States fishermen in Lake Erie at the present time.

The Lake Erie Fisheries Exploration and Gear Research station was opened in Sandusky, Ohio, in early September 1958. The current program objective is experimental smelt fishing with a lampara seine. Lampara seines and other types of pelagic fishing gear, new to Lake Erie, will be tested to determine whether they may be introduced to the commercial fishery as a practical and economical means of capture of underutilized fish having commercial potential.

* * * * *

LAMPARA SEINES TESTED IN SMELT FISHERY (Cruise 1, October 1-31, 1958): A systematic depth-recorder survey was made of Lake Erie between Vermilion, Ohio, and Erie, Pa., to determine whether surface schools of smelt and other schooling fish were available to lampara seine gear. A total of seven lampara seine sets were made with a 100-fathom cotton net where good fish recordings were obtained. No commerciallly-important catches were obtained. Three sets off Vermilion, Ohio, in 30- to 45-foot depths caught emerald shiners in amounts ranging between 50 and 75 pounds. Although sizable concentrations of fish had been indicated on the depth-recorder, most fish were too small for the mesh size of the net in use. One set off Fairport, Ohio, in 35-foot depths fouled on an obstruction and the catch was lost.

This is the first cruise (October 1-31, 1958) of a series to be made to test fishing gear not generally used in the Great Lakes Fisheries. The first part of this cruise was made by the U. S. Bureau of Commercial Fisheries chartered vessel Pat, a small trap-net boat. Since the boat was not available after October 15, 1958, work was continued without interruption with the chartered M/V Thelma H.

Extensive unidentified midwater tracings were found widely scattered over western Ohio waters. Tracings from eastern Ohio waters, over a large area, revealed sizable concentrations of fish near the bottom, but these were unavailable to the lampara seine. Samples taken from these schools with a 16-foot try-net trawl identified them as smelt and yellow perch.

During more than half the cruise period, operations were hampered considerably by high winds and rough waters. These conditions are not suitable to seine op-

erations for a small vessel such as the typical 40-foot trap-net boat. During the first week of operations several trials, under favorable weather conditions, demonstrated the practicability of setting and hauling the lampara-type seine using the regular trap-net reel and standard deck winch.

Great Lakes Fishery Investigations

SURVEY OF WESTERN LAKE ERIE FISH POPLATIONS CONTINUED (M/V Cisco Cruise 11): Regular trawling was continued during the October 21-31, 1958, cruise--the final cruise of the 1958 season--by the U. S. Bureau of Commercial Fisheries research vessel Cisco in 10 areas in western Lake Erie. The composition of the catches was similar to that of cruise 10 but with fewer adult sheepshead and young-of-the-year white bass and more adult smelt. Yellow pike (walleyes) continued to be scarce. Adult yellow perch usually made up the bulk of the catch. Emerald shiners, spottail shiners, trout-perch, and young-of-the-year sheepshead, yellow perch, smelt, and alewives were often numerous. Taken in smaller numbers were gizzard shad, white suckers, goldfish, carp, silver chubs, channel catfish, brown bullheads, stonecats, log-perch, johnny darters, and young-of-the-year white crappies and black crappies. A single, large sea lamprey (21.9 inches) was also caught.

Young-of-the-year fish, which now have probably completed their year's growth, have attained the following approximate average total lengths: yellow perch, 4.1 inches (3.6 inches in Sandusky Bay); alewife, 4.3 inches; sheepshead, 4.1 inches; smelt, 2.7 inches; channel catfish, 2.9 inches; gizzard shad, 3.6 inches in Sandusky Bay and 4 inches for the few taken in the open lake.

Surface water temperatures cooled steadily throughout this cruise, averaging about 11° C. (51.8° F.) at the close of the cruise. Extremes were 10.3° C. (50.5° F.) and 15.4° C. (59.7° F.).

The Bureau of Commercial Fisheries research vessels Cisco and Musky, and the SP-2 and SP-5 from the Ohio Division of Wildlife, cooperated in synoptic surveys of western Lake Erie on October 28, 29, and 30. The vessels followed essentially the courses established during the synoptic surveys of May and August (cruises 3 and 7). Water samples and surface temperatures were obtained at 2-mile intervals by each vessel. Two hundred drift bottles were released and extensive meteorological data were recorded. Bathythermograph lowerings were made by the Cisco and Musky, and analyses of water for total alkalinity and turbidity were made on these vessels. Fluorescein dye was released from the SP-2, SP-5, and Musky to gather information on the surface currents around the islands and in the littoral areas.

Preliminary analysis of 18 drift-bottle returns indicate that in the open area of the lake the surface currents were toward the south, apparently caused by the strong north winds that blew on the day of release and following release. All 18 recoveries were from the Ohio shores with the exception of one found near Monroe, Mich., and one from Middle Bass Island. It appeared from the drift-bottle returns that a current along the south shore was flowing from west to east. The fluorescein dye experiments substantiate very well the movement of the drift bottles. Offshore the dye flowed to the south, whereas at inshore areas off Ohio the dye flowed from west to east, and out the South Channel.

Preliminary analysis of turbidity, surface water temperature, and total alkalinity suggest that Maumee River water was confined to a narrow band flowing eastward along the south shore. The main flow of Detroit River water appeared to be further south than it was during the May and August synoptic surveys.

* * * * *

WESTERN LAKE SUPERIOR HERRING AND GENERAL FISHERY SURVEY CONTINUED (M/V Siscowet Cruise 7): The three index stations occupied during cruises 1 and 3 were visited again (October 15-November 4, 1958) by the U. S. Bureau of Commercial Fisheries research vessel Siscowet during this cruise to obtain a measure of fishery and environmental conditions during the fall months. These stations are located (1) north of Little Girls Point, Mich., (2) southeast of Stockton Island, and (3) northeast of Bear Island (two of the Apostle Islands, Wis.). In addition to these, two additional stations were established for experimental fishing on Gull Island Shoal and just north of Rocky Island.

Fish were collected with gill nets at each index station where samples were taken for analyses of plankton, bottom fauna, and water chemistry. Bathythermograph casts were made at all stations.

Trawl tows were made in 300 feet of water between Stockton and Madeline Islands. Two species of muddlers were captured in great numbers and were tentatively identified as the slimy muddler and and deep-water sculpin (Myosocephalus quadricornis thompsonii). Several hundred ninespine sticklebacks as well as a few chubs (Leucichthys hoyi and L. zenithicus) were taken. Young-of-the-year smelt were predominant in a tow made in the same general area but in shallow water (30-60 feet).

Catches in the experimental gill nets at the three index stations were far greater than the catches made during cruises 1 and 3. At station 1, smelt, herring, burbot, and longnose suckers dom-

inated the catch. At this station during the previous cruises chubs dominated the catch. At station 2, smelt, lake trout, menominee whitefish, and longnose suckers dominated the catch. Practically no smelt were taken at this station during previous cruises, but many whitefish and menominee whitefish were taken. At station 5, 482 chubs (L. hoyi, L. kiyi, and L. zenithicus) and 37 herring were captured, compared to 273 chubs and no herring during cruise 3. This station was not fished during cruise 1.

Experimental small-mesh gill nets were set on Gull Island Shoal to determine what predation, if any, occurred on lake trout eggs. Lake trout were known to have spawned in this area a few days previous. The gang consisted of 1-, 1½-, 2½-, and 4½-inch nets. These nets were lifted two consecutive days with a total catch of 172 longnose suckers, 40 menominee whitefish, 34 northern lake chubs, 11 herring, and 1 lake trout. Stomachs from each species were examined but no signs of lake trout eggs were found. No smelt were captured, although they have been suspected by some of general predation on lake trout eggs.

Another experimental set was made in the shallow waters (11-30 feet) just north of Rocky Island in an effort to capture spawning whitefish. This experimental gang consisted of 4½-, 5-, 5½-, and 6-inch nets. No whitefish were taken; the total catch consisted of 4 longnose suckers. This area will be visited again in further attempts to capture mature whitefish.

Surface temperatures varied from 52.7° F. at station 1 to 47.5° F. at station 27, north of Rocky Island. Bottom temperatures varied from 49.5° F. at station 1 to 40.0° F. at station 5, northeast of Bear Island.

Maine Sardines

CANNED STOCKS, NOVEMBER 1, 1958: Distributors' stocks of Maine sardines totaled 312,000 actual cases on November 1, 1958--14,000 cases or 4.7 percent more than the 298,000 cases on hand November 1, 1957, according to estimates made by the U. S. Bureau of the Census.

Canners' stocks on November 1, 1958, totaled 1,037,000 standard cases (100 3¾-oz. cans), 300,000 cases (22 percent) less than on November 1, 1957.

The 1958 pack from the season which opened on April 15, 1958, to November 1, 1958, amounted to about 1,850,000 standard cases as compared with 2,035,000 cases packed in the same period in 1957. The 1958 season pack to November 15 was 1,967,000 cases. The pack for the entire 1957 season totaled 2,117,151 standard cases.

Canned Maine Sardines--Wholesale Distributors' and Canners' Stocks, November 1, 1958 with Comparisons

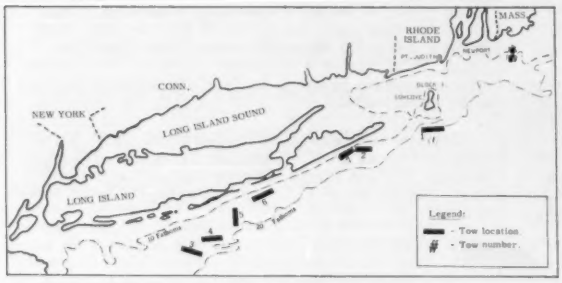
Type	Unit	1958/59 Season	1957/58 Season				
		11/1/58	7/1/58	6/1/58	4/1/58	1/1/58	11/1/57
Distributors	1,000 Actual Cases	312	184	237	293	230	298
Canners	1,000 Standard Cases 1/	1,037	386	235	476	1,111	1,337

1/ 100 3¾-oz. cans equal one standard case.

The total supply as of November 1, 1958, totaled 2,263,000 standard cases, or 8.2 percent less than the total supply of 2,464,000 cases as of November 1, 1957. Shipments from April 15, 1958, to November 1, 1958, amounted to 1,226,000 standard cases as compared with 1,124,000 cases during the same period in 1957.

North Atlantic Fisheries Exploration and Gear Research

EXPLORATORY FISHING FOR LAUNCE OFF SOUTHERN NEW ENGLAND AND LONG ISLAND UNSUCCESSFUL (M/V Delaware Cruise 6): To assess the commercial potential of the launce or sand eel (Ammodytes americanus) off the New England coast was the aim of the second in a series of cruises (October 23-31, 1958) by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware. Seven tows, with a small-mesh 100-foot Holland launce trawl, made between Block Island and off the south coast of Long Island during the second port of the trip, failed to yield any launce. But some commercial concentrations of butterfish (Poronotus triacanthus) were found in the Atlantic Ocean area off Eastern Long Island. The pressure of butterfish in commercial quantities all over the area surveyed is to be expected during the fall months. The catch rate was 500 pounds per hour tow on one drag and 600 pounds on another drag. A No. 41 trawl, equipped with rollers and lined with small-mesh twine from the Holland launce trawl was used on these two tows. The gear used allowed towing of the small-mesh cod end by the Delaware and yielded small quantities of anchovies (Anchoa nepsetus and bone squid (Loligo pealei) of $\frac{1}{2}$-1 inch, showing that the gear fished properly for small fish.



M/V Delaware (Cruise 58-6).

The cruise was a coordinated survey of the Bureau's M/V Delaware and commercial fishing vessels from Point Judith, R. I. Prior to this cruise, the Point Judith trawler David D., using one of the Bureau's launce trawls, caught about 2,000 pounds of launce in three tows off Block Island in Cow Cove. Bad weather hindered fishing by the Delaware. No stocks of launce were found. Tows were made in moderate seas and one trawl was destroyed completely due to the vessel's surge in rough seas.

North Atlantic Fisheries Investigations

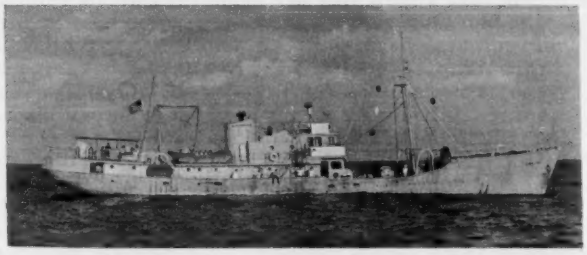
FALL 1958 HADDOCK SURVEYS INDICATE POOR CATCHES UNTIL MID-1960: There is little hope for relief in the New England haddock fishery until 1960, according to results of surveys in October-November 1958 by the U. S. Bureau of Commercial Fisheries research vessel Albatross III. During this period the vessel surveyed the areas of principal interest to the New England haddock fleet (Georges Bank, the Gulf of Maine, and Browns Bank).

The survey was planned to estimate the abundance of fish which are at present too small to be caught by commercial nets but which will be entering the catch during the next two years. The Albatross III found insufficient quantities of these to forecast any material increase in catches before the spring of 1960.

The forecast by quarters for the next two years in terms of market-size haddock on Georges Bank is: 1959: 1st quarter - fair; 2nd quarter - fair; 3rd quarter - poor; and 4th quarter - poor. 1960: 1st quarter - poor to fair; 2nd quarter - fair to moderate; 3rd quarter - moderate; and 4th quarter - moderate to good.

A haddock year brood first appears in the catches when it is two years old. The number of fish taken from any particular brood thereafter are high for three or four years and then taper off. When there is a successful spawning of haddock every year, a new group of two-year olds appear each summer, and there is a continual supply of young fish and older fish as well.

In recent years there has been a successful spawning only every other year, and the industry has come to rely more and more on scrod haddock (under 2.5 pounds) which appear in alternate years, for some reason in even-numbered years. This cycle was broken, however, this year. The 1956 year brood failed to materialize.



Service's research vessel Albatross III.

This placed the haddock fishery in the worst position it has been in for many years as far as the natural resource is concerned. Haddock landings at Boston from July-October 1958 were only 25 million pounds as compared with 37 million pounds last year for the same months. The catch per trip in those months dropped from 80,000 pounds in 1957 to 55,000 pounds in 1958.

The future of the resource now depends upon those fish spawned after 1956. There have been two broods. The 1957 brood is on the banks as one-year-old-fish. The 1958 brood has just settled to the bottom where it can be sampled and counted. The Albatross III found very few one-year olds, so there is little hope for an abundance of scrod next summer. However, some concentration of the 1958 year-class was found, so the picture is brighter for a scrod catch in the summer of 1960.

Between the summer scrod seasons the catches will hold up fairly well since the abundance of older fish on Georges Bank has not been reduced much below the average for recent years. The Browns Bank stock of older fish, which is normally fished in the winter and spring, appears to be about average also.

Diversion of the fleet to Nova Scotian and Newfoundland banks will not help as haddock are scarce on these banks also. Some relief may be gained by concentrating more upon other species such as pollock and cod. Pollock stocks appear to be good, and cod stocks appear to be recovering after a long period of scarcity.

The reason for the failure of recent haddock broods is not fully understood. There is no reason to believe that it is related to the size of the spawning stock, and there is no evidence that the fishery is responsible. The mesh regulation, of course, improves the catch from any given year brood, but it operates only on whatever quantity of small fish nature provides.

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INSTRUMENTS USED WITH TELEVISION CAMERA CALIBRATED (M/V Albatross III Cruise 121): Instruments used with the television camera and nets for measuring water temperature, depths, and currents were calibrated over a measured mile off Provincetown, Mass., by the U. S. Bureau of Commercial Fisheries research vessel Albatross III, November 4-6, 1958.

All of the instruments functioned well. Water temperature varied only 0.2° C. (about 0.36° F.) on individual tows. The current through the cod end varied from

almost no difference from the speed of the vessel through the water to a current of one half a knot less than the vessel speed through the water. The speed of the vessel towing a No. 41 trawl was approximately half its speed without the trawl.

A rough relation of cod-end mesh size and over-all size to the speed of passage of water through the cod end could be seen but further work is required to properly specify the effect of different cod ends. Preliminary data suggests that a cover somehow promotes a greater flow through the cod end.

Oysters

DEEP-WATER CHESAPEAKE BAY OYSTER LOSSES DUE TO OXYGEN DEFICIENCY: During the fall of 1958, oystermen from a number of areas in Maryland reported finding most of the oysters dead on the deeper portions of certain bars. At the same time oysters on the shallower parts of the bars were thriving and in good condition. Fortunately, most Maryland oysters are caught in water less than 20 feet in depth, and a number of the deeper bars occur where strong currents prevent the stagnation of bottom water that may cause oyster deaths. The unusually large extent of water areas that were "stagnant," or lacking in oxygen during the summer of 1958, was most evident in August at the time that many crabs were found dead in crab pots and dead fish observed at several points along the Bay shore. The fact that oysters in deep water might also be expected to show an unusually high death rate was pointed out following these August observations.

Scientists at Maryland's Chesapeake Biological Laboratory about 20 years ago first noted that large masses of deep water without oxygen occur in many mid-Chesapeake Bay areas during the summer months. Through continuing research, the causes of this condition are now known. The oxygen dissolved in water comes mostly from the air at the water's surface. Wave action and currents tend to mix surface water with the layers of deeper water so that for much of the year sufficient oxygen for fish oysters, crabs, and other animals is found even in the deepest part of the Bay. In the summer, however, the surface water becomes considerably warmer than bottom water and this makes it lighter in weight so that it tends to remain floating at the surface. Also, fresh water from rain and streams is lighter than salt water and tends to float above it. The result is that a two-layered system is formed with warm, fresher water near the surface and cool, saltier water near the bottom. The division between the layers may be quite distinct with very little mixing. Decomposition of animal and plant remains and respiration by animals and plants soon consume the dissolved oxygen present near the bottom, and inability to mix with surface water cuts off a renewed supply. The result during most summers is that the dissolved oxygen becomes exhausted at depths of about forty feet or more in certain portions of the bay and tributaries. This limits the depth at which oysters can grow and in which oysters or crabs can remain at this season. Winds can cause unusual and exceptional local conditions.

In the summer of 1958 an unusually extensive oxygen deficiency or stagnation was found in the Chesapeake Bay. It extended over a wide area from the mouth of the Rappahannock River north to the waters near Kent Island. The mouth of the Bay and the head of the Bay, for reasons which are known, but are somewhat complex, did not show severe depletion. Many locations in the Bay and in the mouth of the Potomac River were totally lacking of oxygen in all waters more than 20 feet below the surface. Observations by the Chesapeake Bay Institute, the Virginia Fisheries Laboratory, and the Chesapeake Biological Laboratory indicated that the past season produced the most extensive low oxygen mass in the Chesapeake Bay during the last ten years of careful study.

Because of the enormous area involved, it is not possible to know how long any one group of oysters was exposed to this dangerous condition. It is probable that all oysters in the Potomac River and the middle of the Bay, in water deeper than 20 feet, were in danger and that some of them were killed.

The combination of heavy rainfall and lack of strong winds during this summer contributed much to this condition. The heavy rains during the spring and summer brought unusually large quantities of nutrient salts and of plant and animal debris into the Bay. The nutrient salts stimulated extensive blooms of tiny plants that discolor the water and added their material to the bottom layers as they died and settled. A type of bacteria, that grows when oxygen is lacking, flourished upon the plant and animal debris at the bottom and released into the water a poisonous gas known as hydrogen sulphide. Samples of deep water in the affected areas smelled strongly of this gas. It may have been the direct cause of many of the deaths of fish, crabs, and oysters, but its presence was due to the chain of natural occurrences described. In some cases this year winds caused the lethal water to be pushed unusually far over more shallow areas for, in at least one instance, crabs were reported to have been killed in pots set at 12 feet along both the Eastern Shore and the Western Shore.

Fortunately most fish and crabs are able to move out of the affected water so that crabs confined in pots were the chief sufferers. Dead fish were not abundant and were mostly bottom dwellers, such as hogchokers and toadfish. Probably less than 5 percent of the State's oysters grow in the deeper water so that losses among them were limited and chiefly of local concern. Nevertheless, this represents an additional drain upon our already too low reserve supply of oysters. Little can be done by man to prevent losses of this kind except through such measures as removing crab pots from deep water at times of oxygen deficiency, and concentration of oyster cultural practices upon bottoms that are unaffected. In many areas of the world far more disastrous natural kills have occurred than have thus far been seen in the Chesapeake Bay (Maryland Tidewater News, September-October 1958).

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DIVERS STUDY BEHAVIOR OF STARFISH AND INDUSTRY CONTROL METHODS: The lack of good oyster sets since 1945, the repeated destruction of oyster beds by hurricanes, and the presence of a large number of oyster drills in many areas have led to a serious decrease in the production of oysters in Connecticut waters. The tenfold increase in the number of starfish in Long Island Sound, which occurred in 1957, placed the Connecticut oyster industry in a precarious position.

In anticipation of a long and difficult struggle against hordes of starfish, the U. S. Bureau of Commercial Fisheries Biological Laboratory at Milford, Conn., included in its program of assistance to the oyster industry a series of studies to evaluate the methods now employed in fighting starfish, offer suggestions to make these methods more effective, and develop new methods. The biologists decided that, simultaneously with observations on the performance of different types of starfish-destroying apparatus, studies should be conducted on the behavior of the starfish themselves. These studies were initiated in the summer of 1958 and were carried on underwater by SCUBA divers, all biologists of the Bureau,

The program was planned to study the efficiency of regular oyster dredges, suction dredges, the turtle dredge, starfish mops, and the methods of spreading quicklime on the surface and bottom of oyster beds. The studies were made with the cooperation of the Connecticut and New York oyster industries and the Connecticut Shell Fish Commission.

Since the studies were only of short duration and, in many respects, of a pioneering nature, conclusions drawn from the studies may not be final. These studies will be extended considerably in 1959 by carrying them out under a more diverse set of conditions and for a longer period. Underwater television cameras will also be used. As a result of these studies, the biologists hope to offer a more comprehensive and accurate evaluation of the starfish predator problem.

Observations made in the summer of 1958 showed that every device used is now, or can easily be made, quite effective in clearing starfish from the path the device actually covers. But in each case, a certain percentage of starfish was pushed around the leading edge of the dredges and were not picked up. For example, the 30-inch dredge of the Bureau's research boat, Shang Wheeler, left a path almost free of starfish, yet it picked up only about 53 percent of those encountered. The low percentage of catch was due, in part, to the starfish being pushed around the leading edge of the dredge, and partly because the dredge cables removed some of the starfish from the path. This type of loss was apparent with each piece of equipment tested, but the percentage of loss seemed to decrease as the width of the dredge increased. The loss of starfish

increased and the efficiency of the dredge decreased as the dredge filled up with sand, shells, and starfish, which obstructed the passage of water through the dredge bag. Obviously, certain improvements in the design of the dredges are needed to increase its efficiency. Some of these changes will be based on the design of a special starfish dredge used on the oyster and mussel grounds of Holland.

Another defect noticed in connection with the use of standard oyster dredges was the large mesh of the bag which allowed small and, sometimes, medium starfish to pass through meshes. It was demonstrated in one instance that by using smaller mesh such a loss would be virtually eliminated.

In observing the action of suction dredges, it was noticed in one case that the dredge dragged too flat on the bottom and, therefore, the suction base in the front part of the suction head pushed approximately 50 percent of the starfish aside and out of reach of the suction intake. However, in the case of two other dredges which had suction heads inclined at an angle of about 30 degrees, the bottom ahead of the suction opening was not appreciably disturbed. Only a few starfish were pushed around the leading edge of these suction dredges, and most of them were captured.

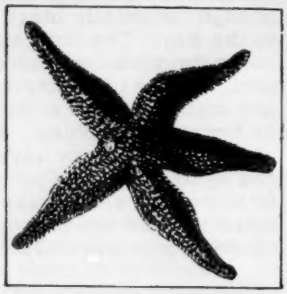
The divers reported that each of the suction dredges tested was powerful enough to utilize a water head, or "wings," to funnel the starfish into the suction opening, thus picking up many more starfish per unit of effort.

In studying the action of starfish mops, it was noticed that the bar to which the mops are attached often bounced along the bottom and only from 20 to 40 percent of the surfaces of the mops were on the bottom at times. However, almost all the starfish that were disturbed by the mop action on the bottom were caught by entangling in the mops. Only those at the end of the bar were pushed outward and lost. Again, as in the case of mechanical and suction dredges, certain improvements in the design and structure of the mops suggest themselves and should be incorporated in the newly-designed mops. Studies of the effectiveness of these mops will be made in 1959.

The effectiveness of quicklime in killing starfish depends, to a very large extent, upon the proper method of application and the concentration used. When the lime was spread on the surface at the rate of $\frac{1}{4}$-ton per acre, the divers could observe the particles settling through the water and estimated that about 85 percent of the starfish were hit by them. These lime particles were about $1\frac{1}{2}$ inches apart on the bottom. Since during the liming process the tide was running at almost 2 knots, it is obvious that such a strong current could carry many lime particles, especially the finer ones, far away from the point where they first entered the water.

When the lime was spread on the bottom by a boat belonging to an oyster firm, one particle of lime was found per quarter-of-an-inch of bottom surface. About 95 percent of the starfish were hit by the lime. The observers believed that the industry liming boat performed this operation very efficiently.

It is believed that to achieve more effective results with lime the mechanical aspects of the method should be further developed and perfected. In principle, it is an excellent and cheap means of fighting starfish and this has been demonstrated on many occasions under laboratory and field conditions. By misusing it, because of a lack of the necessary facilities for uniform and proper spreading, too light or too heavy concentrations, using inferior grades, or spreading the lime when the tide runs too swiftly, the method may be discredited. In 1959, with the cooperation of several oyster companies, Bureau biologists hope to conduct further studies on the application and effectiveness of lime as a method of fighting starfish.



While studying various aspects of the performance of the devices used in fighting starfish, the divers had the opportunity to make extensive observations on the behavior of starfish under normal conditions. Starfish were seen feeding on oyster spat, clams, moon snails, several other species of mollusks, and dead crabs. A large starfish was observed with its stomach pressed to a shell covered with oyster spat. When the starfish was pulled away by the diver, all the small oysters which had been under the stomach of the starfish were killed, while those outside this area were alive and apparently normal. This observation shows that a single large starfish can feed on several small oysters simultaneously.

Another rather important observation was that starfish can protrude their stomachs into the siphon hole of hard clams (Venus mercenaria) and consume them. This ability of starfish to kill clams that are dug in may account for the unexplained mortality of thousands of medium and large hard clams noted in New Haven Harbor while observing the operation of the suction dredge Quinnipiac.

The divers also studied starfish movements. They reported that if the current is less than one knot, starfish glide along in any direction, with only their tube feet at the tips of the rays touching the bottom. The observed rate under these conditions was about 6-8 inches a minute, or somewhat less than the maximum that we reported by our earlier experiments. Since starfish are so nearly neutral in buoyancy and seem to be firmly attached only when feeding, any spurt of current can carry them for several feet if they become detached. A current of about two knots is strong enough to accomplish this. When the current reached this strength or exceeded it, the starfish were observed floating parallel to the bottom singly, in two's and three's, and sometimes in larger groups. Some individuals were seen tumbling along "end over end." In some instances, usually when the current was very strong, starfish were seen with the tips of their rays curled, forming an open ball, and were readily rolled along by the current.

The observations showed that the movements of starfish by currents can result in distribution over a large area in a comparatively short time This was sustained by another observation that within 15-30 minutes after the passage of dredges or mops, the path which was almost completely clean of starfish would sometimes again contain just as many starfish, which had been brought into the cleared zone by the current. Because of such rapid movements of starfish from adjacent areas, evaluation of the killing effect of lime may not always be accurate if only comparatively narrow areas are covered. For example, in some instances, starfish showing effects of lime were found outside the limed area in about the same numbers as were within the limed zone. Obviously, starfish from the limed area which had been hit by particles of lime were scattered over the adjacent areas, while starfish in the untreated areas had entered the limed zone.

The actual number of starfish on the bottom varied from 2 individuals per 50 square yards on Lot 152 in the New Haven, Conn., area, where energetic measures for fighting starfish were employed, to 681 individuals per 50 square yards in some Milford areas, where no control measures were applied.

Lot 152, New Haven, was selected to determine the effectiveness of intensive efforts to control starfish. This lot was intensively dredged and mopped from about the middle of June to the middle of July, the period prior to the planting of cultch. The mopping was followed by liming of the areas surrounding this lot. Moreover, outside the limed zone, the bottom was continuously mopped to reduce the number of starfish. On August 22 the divers examined this lot and found three starfish per 50 square yards. In the limed areas surrounding the lot, they found six healthy starfish and a few with lime lesions per 50 square yards. In the mopped area outside of the limed zone there were 12 starfish per 50 square yards. Thus, it appeared that the intensive efforts mentioned above had kept Lot 152 and adjacent bottom comparatively free of starfish.

On August 26, a large number of starfish was again found on the lot, making it necessary to move the oyster set from that area. The heavy invasion would probably have occurred much sooner if the lot had been less actively protected. Its occurrence indicates the virtual impossibility of keeping a relatively small lot free of starfish without reducing their number within adjacent areas so as to create a wide safety zone around the cultivated oyster bed. Biologists and practical oystermen realized this in the past, and we recommended this approach many years ago. However, a much larger oyster fleet than the present one is needed to fulfill this task.

The starfish do not complete their life cycle in a single year but may live for a long time. This has been demonstrated by keeping adult starfish in our laboratory for several years after they had become fully mature. Some of them were marked with vital stains and, therefore, their identity was unmistakable. European biologists have kept closely related starfish species in aquaria for five and six years. Observations on distribution and occurrence of starfish in Connecticut waters also indicated that it takes several years before a year-class shows a decided decrease in its numbers. This suggests that the oyster industry cannot hope that the large number of starfish now present in Long Island Sound will soon disappear. On the contrary, it is expected that the starfish will remain in Long Island waters for several years and oystermen should be prepared to combat them most energetically to save the remaining oyster beds. With such a purpose in mind, the Milford Laboratory will continue to work on the development of better methods of starfish control (Bulletin No. 4, Fisheries, Biological Laboratory, Milford, Conn.).

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MARYLAND'S CHESAPEAKE BAY OYSTER SET POOR IN 1958: A complete picture of 1958 oyster setting in Chesapeake Bay waters of Maryland must await the end of the 1958 setting season and completion of counts throughout the State, according to biologists of the Maryland Chesapeake Biological Laboratory. There are early indications, however, that the Maryland set in 1958 was poor in many areas. Up to late September 1958 there had been little or no setting in most of the Patuxent River, the adjacent Chesapeake Bay, the St. Marys River, and upper Fishing Bay. Preliminary reports show a similar condition in the Eastern Bay area. A below-average set was observed in Smith Creek, Honga River, Tar Bay, and the Manokin River area. The best set observed was at Holland Straits, where a good but not exceptionally heavy set was indicated. These statements are based upon test-shell findings compared with similar observations during previous years. The final picture may be altered by poor survival of the spat observed, or by unexpectedly late setting which is possible up until about mid-October.

Many factors may cause great variations from year to year in oyster spawning, the survival of oyster larvae, and the attachment of spat. Among these are: abundance of brood stock, salinity of the water, temperature conditions, food for larvae, scattering of larvae by tides and currents, chemical conditions, cleanliness of "cultch" or shells, presence of diseases that affect larvae and spat, abundance of enemies that feed upon larvae and spat, silt deposits on shells, smothering by fouling growths, and many others. A favorable combination of all these factors seldom occurs. Few of them can be changed by man except the abundance of brood stock and the presence of clean shell as cultch in places where oyster larvae tend to concentrate naturally. By providing these two, however, the average amount of set can be increased under most conditions.

At least three unfavorable factors were apparent in 1958:

(1) Adult oysters or brood stock were too thinly scattered in many areas for most effective spawning. The spawn of one sex in the water will stimulate spawning by the opposite sex. Oysters close together in beds tend to spawn completely while widely-scattered oysters may spawn very little. A good oyster market in recent years has increased the drain on the oyster beds.

(2) Extensive areas of bottom water have been deficient in oxygen. This not only has killed some oysters in deep water and affected the amount of spawning, but has offered a great hazard to the survival of oyster larvae during the two weeks that they drift with the tide before setting.

(3) Exceptionally low salinity has existed this spring and summer throughout the Chesapeake area. It always has been noted that setting is more abundant towards the lower bay and that setting generally is better in the saltier areas if other conditions are favorable. Recent and important research upon the survival and growth of clam and oyster larvae at different salinities has been conducted at the Milford Biological Laboratory of the United States Bureau of Commercial Fisheries. This research demonstrated effectively that even oysters which live in low salinity water (Hodges Bar) required a salinity of between 10 and 15 parts per thousand for best development of their eggs. Oysters grown in more salty water needed a higher salinity. Over most of the Maryland portion of the Chesapeake, salinities during the spring and early summer of 1958 were generally below the above figure and it is probable that this may have been the principal reason for the poor setting that occurred over most areas. It seems significant that the setting thus far observed occurred in the higher salinities represented (Maryland's Tidewater News, Sept.-Oct. 1958).

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OYSTER-SETTING EXPERIMENT IN ARTIFICIAL POND SHOWS PROMISE: Experiments in an artifical pond on Long Island, N. Y., show that one of the successful methods for obtaining an oyster set is to release large numbers of oyster larvae which are about to set. These experiments are being made by U. S. Bureau of Commercial Fisheries shellfish biologists. By this method a set of native oysters was obtained which grew well under local conditions.

The experiments indicate that this method may be the simplest one for obtaining a commercial oyster set in artificial ponds or tanks. This is due to the difficulties encountered in maintaining a proper balance of temperature, salinity, chemical balance, food content, and other factors in artificial ponds long enough to permit normal development of oysters from the egg stage to the setting stage.

Pacific Oceanic Fishery Investigations

TUNA FEEDING BEHAVIOR IN LINE ISLANDS AREA STUDIED (M/V Charles H. Gilbert Cruise 42): The feeding behavior of skipjack and yellowfin tuna to chumming with bait and water sprays was studied during the October 9-November 17, 1958 cruise of the U. S. Bureau of Commercial Fisheries research vessel Charles H. Gilbert.

The first half of the cruise was spent in the vicinity of the Hawaiian Islands, but because of the scarcity of tuna schools little was accomplished. This led to the decision to continue the cruise in the vicinity of the Line Islands where, as was expected, schools of tuna were found.

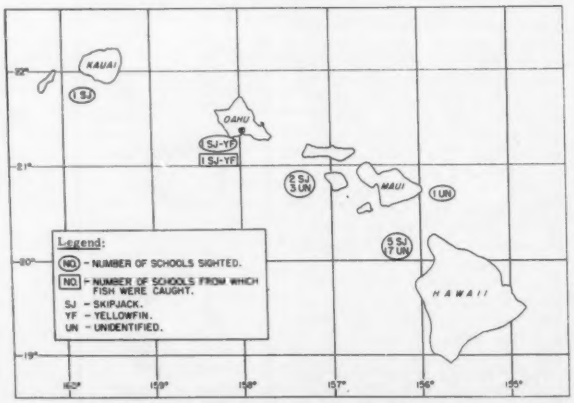

Fig. 1 - Location of schools sighted and fished in the Hawaiian Islands. M/V Charles H. Gilbert Cruise 42 (October 8-November 17, 1958).

During 9 days of active pole-and-line-bait fishing in the Line Islands area, 69 fish schools were sighted. Of these 38 schools were positively identified as skipjack or yellowfin; and at least 6 of those identified were large schools estimated at 10 to 15 tons of fish each.

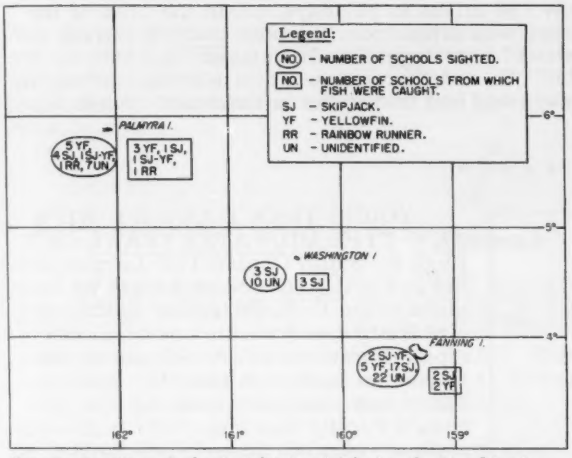

Fig. 2 - Location of schools sighted and fished in the Line Islands. M/V Charles H. Gilbert Cruise 42 (October 8-November 17, 1958).

Observations were made from a submerged caisson or chamber and the behavior of both skipjack and yellowfin to lamp black dye solutions in the water, to chumming with tilapia and mullet, and to water sprays was studied. This was the first opportunity the biologists have had to observe yellowfin tuna and to compare their behavior with that of skipjack.

In general, the reactions were similar for both species except that the yellowfin swam below the skipjack, at about a depth of 10 feet, and made dashes upward to feed upon the tilapia or mullet bait.

Two days were spent bait fishing in the Line Islands, one day each at Fanning Island and Palmyra Island. The bait was predominantly 3-8 inch mullet. Sixty-six buckets were caught at Fanning Island and 133 buckets (40 of which were released) at Palmyra Island.

The successful fishing in the Line Islands area emphasizes the seasonal nature of the Hawaiian fishery. In Hawaii, surface schools of skipjack are not abundant enough to support a satisfactory fishery during 4 or 5 months of the year. Due to high capital investments associated with tuna fishing, this seasonal pattern can never furnish a fully satisfactory basis for a prosperous fishery. It's equally obvious that during the Hawaiian off-season fish are fairly abundant in reasonably nearby areas.

At the moment the principal reason why these areas cannot be fished from Hawaii is the lack of a bait fish sufficiently hardy to withstand a 3-5 day journey at sea. Two approaches are being used to break this bottleneck: (1) the intensive production of tilapia as tuna bait; and (2) the introduction of other bait species to Hawaii. One of these programs, the introduction of the Marquesan sardine to Hawaii, has shown great promise, for the sardine has definitely spawned in Hawaiian waters and may well become abundant over the next few years. The other, the culture of tilapia, is already being utilized by the industry to a limited extent.

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TUNA TAGGING RETURNS REVEAL GROWTH RATES AND MOVEMENTS: Skipjack tuna from Hawaiian waters tagged with the dart tag developed by U. S. Bureau of Commercial Fisheries biologists during 1957 and 1958 continued to be recovered during October 1958. Of the total of 12 recoveries, 11 showed random movement within the fishery. The other recovery was of particular interest in that it provided additional information on the rate of growth of these tuna. This fish was tagged and released off Hilo, Hawaii, early in September 1957. When captured near the end of October 1958, its weight had increased from about 4 to 18 pounds, a growth rate of about a pound a month. There has been at least one recovery of tagged skipjack each month since the release of the 3,200 tagged fish in September 1957.

Two albacore tuna tag recoveries were reported during October 1958, bringing the albacore tag recovery total to 16 (1.3-percent recovery rate). The 15th recovery was made by the California albacore boat Mable on July 21, 1958, at 34°00' N., 122°10' W. This fish had been tagged on November 21, 1956, by the M/V Charles H. Gilbert of the U. S. Bureau of Commercial Fisheries at 35°21' N., 123°57' W. Thus, this fish made a net movement of only 130 miles in 607 days within the area of the west coast fishery. The 16th recovery was made from the boat Daiho II during the trip of August 12-29, 1958. This fish had been tagged on November 16, 1956, by the Charles H. Gilbert at 36°48' N., 127°33' W., and when retaken at 32°38' N., 123°00' W., it had been at liberty for about 640 days and had traveled a net distance of 345 miles within the West Coast fishery.

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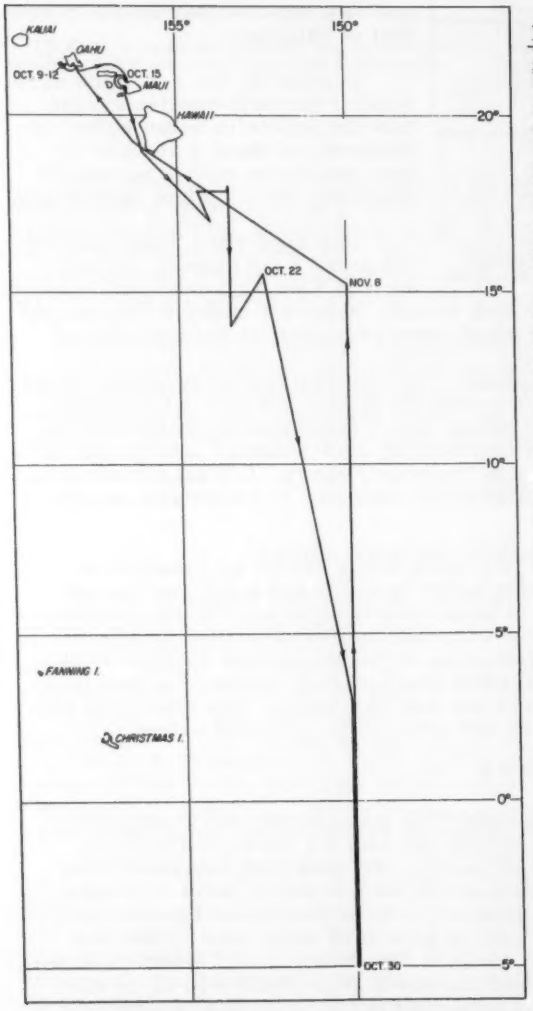

M/V Hugh M. Smith cruise 47 (October 9-November 11, 1958).

YOUNG TUNA CAUGHT WITH NEW-TYPE MIDWATER TRAWL (M/V Hugh M. Smith Cruise 47): Larger Numbers of young tuna were caught by biologists of the U. S. Bureau of Commercial Fisheries with the use of a new-type midwater trawl developed by the Fisheries Research Board of Canada. The young tuna were taken by the Bureau's Pacific Oceanic Fishery Investigations research vessel Hugh M. Smith during an October 9-November 11, 1958, cruise from Hawaii to a few degrees south of the Equator. Collection of young tuna is of special interest because they are rare in collections.

In addition to the young tuna, a great many varieties of fish of importance as tuna forage were taken. The comparative abundance of tuna forage from place to place is of importance in the study of the distribution of tuna since the abundance of available food influences distribution.

This cruise marks the first time the new-type midwater trawl has been used in the central Pacific. The trawl is about 40 feet across the mouth and was towed at speeds up to 4 knots at depths ranging from the surface down to 800 feet. Other than the collections of young tuna and of tuna forage obtained through the use of the trawl, the catches included large numbers of rare fishes.

In addition to the fishing with the trawl, oceanographic observations were made during the cruise in the extension of the California Current southeast of Hawaii and in the newly-discovered undercurrent flowing east along the Equator as a follow-up to studies made in the spring of 1958.

Contrary to expectations, no tuna schools were sighted in the region of the California Current so plans for live-bait fishing and stomach sampling were not accomlished, and unfavorable weather prevented the use of the Canadian midwater trawl. Hauls were made with the Isaacs-Kidd trawl, however, and with the 1-meter plankton net.

Very few tuna schools were sighted during the cruise. Five skipjack schools were chummed using tilapia as bait but no fish were caught. The schools were small in size and very wild. Surface trolling was conducted with two lines during the daylight runs. The catch consisted of 7 dolphin, 1 wahoo, 1 skipjack, and 1 yellowfin tuna.

Salmon

AERIAL CENSUS USED TO COUNT SALMON EGG NESTS IN COLUMBIA RIVER BASIN: Aerial census techniques used in making counts of game animals and birds also are being applied by Bureau of Commercial Fisheries biologists to count salmon nests in the Columbia River Basin. Weekly surveys were made by Washington State and Bureau biologists in 1958 to determine the peak of spawning. One survey is made after the peak count is attained.

Spawning chinook salmon females in gouging out a nest overturn brown algae-covered gravel and small rocks exposing fresh, light-colored surfaces. The "redds" (salmon nests) appear as bright spots in the gravel and are readily seen from the air. Biologists in small light planes count the number of nests in a river system as an index of the number of fish utilizing a spawning area. These surveys are repeated annually (since 1948) for comparison of changing abundance in salmon spawning populations.

Information obtained from the aerial surveys is used to determine the size of a spawning area and how many spawners are involved in the region of each proposed dam. The count is made for each section of the river. For example, for the Priest Rapids Dam this information was sought--what is the extent of spawning in the vicinity and how much spawning area will be lost when the hydroelectric project is completed?

With the facts at hand, biologists seek to work out programs for the conservation of the salmon runs whether it be artificial spawning areas as is being tried at McNary Dam on the Columbia River, additional hatcheries for rearing salmon, or other projects.

Plane surveys of salmon nests are also made by the Idaho Fish and Game Department and the Oregon Fish Commission, the state agencies charged with the protection and wise utilization of the fisheries resource. The actual fish--pink, red, and chum salmon--are counted in aerial surveys by fisheries scientists in Alaska.

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NEW OREGON SALMON HATCHERY COMPLETED: The new Cascade $500,000 salmon hatchery, located on Oregon's Eagle Creek just above Bonneville Dam on the Columbia River, was opened officially by the Oregon Fish Commission late in October 1958.

"Nine million fall chinook eggs obtained from fish returning to Eagle Creek are scheduled for rearing at the new hatchery next spring," the Commission's Director of Fish Culture stated.

"Cascade hatchery can rear about 11 million salmon annually," he reported, "and its activation brings to 16 the number of Commission-operated units in the State, producing at the present time an average of 25 million salmon and 3 million steelhead each year to provide fish for both commercial and sport fishermen."

The hatchery was constructed under the Federally-financed Columbia River fisheries development program--a program started in 1948 to offset losses of migratory fish runs resulting from Federal dam construction of the main Columbia River. Cascade is the second completely new hatchery constructed for Commission use under the Columbia River program. The first is located at Sandy, Ore. Four other hatcheries have been renovated under this program.

Sea Lions

POPULATION OFF CALIFORNIA COAST INCREASES: The sea lion population off the California coast increased from 8,700 in 1947 to 19,700 in 1958, according to the California Department of Fish and Game. At least 10 percent of the increase, and possibly more, is due to the fact that pups were counted for the first time this year.

In 1947, photographic census takers, who made the count from a slow-moving blimp on loan from the United States Navy, were able to distinguish between pups and adults. But only adults were enumerated due to uncertainty as to how many pups survived the hazardous early days ashore or until able to swim. Many of them are crushed to death by the ponderous and careless adults.

Sea lions on rookery about one week before height of breeding season.

In 1958 the census was made by a fast plane, which was more efficient because the entire count took only 3 days, compared to 3-4 weeks in 1947. Since adults and pups could not be distinguished one from the other on the photos, all were counted as sea lions.

Most of the population increase occurred in the channel islands of Southern California where 12,450 were counted, compared to 2,680 for the same area in 1947. The increase in Northern California over the 11-year period was only 2,000, or from 5,000 in 1947 to 7,000 in 1958.

The three channel islands which had the heaviest populations are: San Miguel, 5,190 (650 in 1947); San Nicolaus 3,070, (660 in 1947); and San Clemente, from zero to 1,500.

In addition to the sea lions, the Department counted 444 sea elephants, all of them on San Miguel Island.

Tuna

CALIFORNIA PACK AND CANNERY RECEIPTS SET NEW RECORD: The California 1958 canned tuna pack passed 10 million standard cases during the week of November 10-15, 1958. An estimated 10.3 million standard cases of tuna were packed through November 15 from 207,200 tons of tuna received by the canneries. This sets an all-time annual record and was 700,000 cases above the California annual 1956 pack of about 9.6 million cases.

California cannery tuna receipts for January-October 1958 totaled 201,000 tons--an all-time record, exceeding the previous high ten-months receipts in 1956 by 22,000 tons or 12 percent. Record-high frozen tuna imports of 60,663 tons and a record-high tuna purse-seine catch of 39,000 tons accounted for the new record in cannery tuna receipts in 1958. Cannery tuna receipts during the first 10 months of 1958 also exceeded any previous full year's total except for 1956 and 1954.

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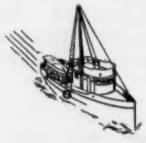
UNITED STATES CLIPPER SURVEYS TUNA RESOURCES OFF WEST AFRICAN COAST: The United States tuna clipper Chicken of the Sea, owned and operated by a Pacific Coast cannery, arrived at Accra, Ghana, on November 8, 1958, for a tuna fishing survey off the West African coast to determine the feasibility of operating in that area.

The arrival of the tuna clipper was preceded by preparatory arrangements to permit the vessel to fish for live bait in Ghana's territorial waters and obtain port amenities in return for an agreement to make available to the Ghana Government the results of the survey and take a Government fisheries officer as observer aboard the survey vessel.

The tuna clipper, which arrived in African waters in October, is surveying the tuna and bait fisheries from the Senegal coast to Ghana. Most observations are made beyond the territorial waters of the countries concerned. The vessel's captain stated informally that tuna fishing grounds in the West African area are very promising in general and that those off the coast of Ghana are particularly impressive. Fishing trials made 20-30 miles off Ghana's Cape Three Points on November 7 produced a catch of about 30 tons of tuna. Fishing had to be suspended due to lack of live bait. Bait supplies off the Ghana coast were not promising during this period, according to the clipper's captain. Fisheries officers confirmed the fact that the continental shelf bait fisheries are highly seasonal, while the off-shelf supply has not been firmly established.

Following the visit to Ghana, the tuna clipper planned to replenish live-bait supplies by fishing within territorial limits and to proceed with the tuna survey well out to sea. The clipper will land in Puerto Rico as soon as it is capacity-loaded. The Pacific Coast cannery that owns the clipper also has a cannery in Puerto Rico.

Assuming that both tuna and bait fisheries are suitable for commercial fishing, the United States cannery may draw up plans to fish off the African West coast and land catches on the United States east coast and, concurrently, to establish a fishing, cold storage, and canning industry in Ghana.



United States Fishing Fleet [1/] Additions

AUGUST 1958: A total of 58 vessels of 5 net tons and over was issued first documents as fishing craft in August 1958. Compared with the same month of 1957, this was a decrease of 1 vessel. The Gulf States continued to lead with 20 vessels, the South Atlantic area was second with 18, and the Chesapeake third with 10.

Table 1 - U. S. Vessels Issued First Documents as Fishing Craft by Areas, August 1958

Area	August		Jan.-Aug.		Total
	1958	1957 [2/]	1958 [2/]	1957 [2/]	1957
	(Number)				
New England . .	-	2	10	15	19
Middle Atlantic	2	1	11	19	23
Chesapeake. . .	10	7	65	67	104
South Atlantic .	18	13	94	84	130
Gulf.	20	22	198	103	166
Pacific	5	9	89	87	102
Great Lakes . .	-	1	5	5	8
Alaska.	3	4	27	40	48
Puerto Rico . .	-	-	-	1	1
Virgin Islands .	-	-	1	-	-
Total. . . .	58	59	500	421	601

2/Revised.
Note: Vessels assigned to the various sections on the basis of their home ports.

Table 2 - U. S. Vessels Issued First Documents as Fishing Craft, by Tonnage, August 1958

Net Tons	Number
5 to 9	19
10 to 19	11
20 to 29	16
30 to 39	8
40 to 49	3
90 to 99	1
Total	58

Fishing craft that were issued documents as fishing craft during the first eight months of 1958 totaled 500 vessels--an increase of 79 vessels as compared with the same period of 1957. Of the vessels documented for fishing, 40 percent were reported from the Gulf States.

1/Includes both commercial and sport fishing craft.

United States Fishery Landings, January-October 1958

Landings of fish and shellfish in the United States and Alaska during the first ten months of 1958 were over 5 percent below those of the same period of 1957. At the end of September 1958, landings were only one percent below those for last year; however, during October 1958 the catch of menhaden was much smaller than in October 1957.

Sardine landings in California were 148 million pounds greater through November 25 this year than for the same period of 1957. Salmon landings on the Pacific Coast including Alaska during the 1958 season were up 41 million pounds. Tuna landings in California for the first ten months of 1958 were over 15 million pounds higher than for the same period in 1957. Ocean perch landings in New England were up 15 million pounds over a year ago.

Menhaden landings were 203 million pounds behind 1957 at the end of October. Jack mackerel landings were better in October but were still 65 million pounds under the ten-month total for 1957. Herring landings in Maine (134 million pounds) were slightly above those of last year for nine months. Herring production in Alaska, however, was short by 37 million pounds. Anchovies in California were down around 31 million pounds. Whiting in New England continued to fall behind last year's catch, although there was some improvement in October.

Table 1- United States Fishery Landings of Certain Species for Periods Indicated, 1958 and 1957 1/

Species	Period	1958	1957	Total 1957
		(1,000 Lbs.)		
Anchovies, Calif.	10 mos.	6,922	37,514	38,408
Cod:				
Maine	9 mos.	2,494	2,058	2,352
Boston	10 "	14,244	16,064	17,487
Gloucester	10 "	2,530	1,582	2,020
Total cod		19,268	19,704	21,859
Haddock:				
Maine	9 mos.	3,310	3,809	4,667
Boston	10 "	75,562	85,300	93,617
Gloucester	10 "	8,872	8,035	8,898
Total haddock		87,744	97,144	107,182
Halibut 2/:				
Wash. & Ore.	10 mos.	15,626	15,430	15,430
Alaska	10 "	19,972	20,733	20,733
Total halibut		35,598	36,163	36,163
Herring:				
Maine	9 mos.	133,963	129,194	153,621
Alaska	Year	80,828	118,290	118,290
Industrial fish, Maine & Mass. 3/	10 mos.	116,294	118,029	130,275
Mackerel:				
Jack	10 mos.	11,042	75,976	86,300
Pacific	10 "	15,710	39,788	55,200
Menhaden	10 mos.	1,369,266	1,572,405	1,681,600
Ocean perch:				
Maine	10 mos.	63,770	56,864	64,723
Boston	10 "	2,106	3,322	3,819
Gloucester	10 "	68,032	58,598	65,389
Total ocean perch		133,908	118,784	133,931
Salmon:				
Wash. 4/	9 mos.	46,276	39,871	43,273
Oregon 4/	9 "	7,736	10,839	11,354
Alaska	Year	248,000	203,437	203,437
Sardines, Pacific	to Nov. 25	178,912	30,462	45,800
Scallops, sea, New Bedford	10 mos.	12,973	14,324	16,461
Shrimp (heads-on), South Atlantic and Gulf States	7 mos.	82,862	96,229	166,737
Wash.	9 "	5,465	1,392	2,458
Oregon	8 "	1,392	286	403
Squid, Calif.	9 mos.	4,862	10,670	12,449
Tuna, Calif.	10 "	280,696	265,456	291,234
Whiting:				
Maine	9 mos.	23,319	15,727	15,810
Boston	10 "	506	976	1,002
Gloucester	10 "	44,775	74,952	76,521
Total whiting		68,600	91,655	93,333
Total all above items		2,948,317	3,127,612	3,449,768
Others not listed		568,178	586,772	1,329,232
Grand Total		3,516,495	3,714,384	4,779,000

1/Preliminary.
2/Dressed weight.
3/Excluding menhaden.
4/Landed weight.

Table 2- United States Fishery Landings by States for Periods Indicated, 1958 and 1957 1/

Area	Period	1958	1957	Total 1957
		(1,000 Lbs.)		
Maine	9 mos.	255,747	240,353	290,528
Massachusetts:				
Boston	10 mos.	108,391	118,287	135,072
Gloucester	10 "	204,735	228,284	248,928
New Bedford	10 "	96,482	90,617	104,334
Provincetown	10 "	21,959	22,709	25,109
Total Mass.		431,567	459,897	513,443
Rhode Island 2/	8 mos.	70,405	86,450	121,273
New York 2/	9 "	31,005	31,551	40,223
New Jersey 2/	9 "	36,301	40,036	50,541
North Carolina 2/	10 "	49,111	60,185	64,634
South Carolina 2/	9 "	11,586	10,585	24,316
Georgia	8 "	11,217	10,734	18,584
Florida 2/	9 "	104,410	96,690	140,698
Alabama	8 "	6,875	8,436	11,882
Mississippi 2/	8 "	10,063	15,354	19,991
Louisiana 2/	7 "	32,571	38,203	63,332
Texas 2/	8 "	35,463	44,453	77,156
Ohio	9 "	15,042	22,815	22,844
Oregon 3/	9 "	50,556	49,855	57,694
Washington:				
Salmon 3/	9 mos.	46,276	39,871	43,273
Other	7 "	63,399	61,926	99,478
California:				
Certain species 4/	10 mos.	498,144	459,866	529,391
Other	6 "	42,524	43,922	86,862
Total Calif.		540,668	503,788	616,253
Rhode Island, Middle Atlantic, Chesapeake, South Atlantic, and Gulf States (menhaden only)	10 mos.	1,365,433	1,550,742	1,661,480
Alaska:				
Halibut 5/	10 mos.	19,972	20,733	20,733
Herring	Year	80,828	118,290	118,290
Salmon	Year	248,000	203,437	203,437
Total all above items		3,516,495	3,714,384	4,280,083
Others not listed		6/	6/	498,917
Grand Total		6/	6/	4,779,000

1/Preliminary.
2/Excludes menhaden.
3/Landed weight.
4/Includes catch of anchovies, jack and Pacific mackerel, Pacific sardines, squid, and tuna. Data on sardines are through November 25.
5/Dressed weight.
6/Data not available.

Note: Data principally represent weight of fish and shellfish as landed except for mollusks which represent the weight of meats only.

U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, AUGUST 1958: Imports of edible fresh, frozen, and processed fish and shellfish into the United States during August 1958 were down 9.9 percent in quantity and 11.0 percent in value as compared with July 1958. The drop was due to sharply lower imports of frozen groundfish fillets, and to a lesser degree, a drop in the imports of sardines and lobsters. These declines were partly offset by a 5.3-million-pound increase in the imports of frozen tuna.

Compared with August 1957, the imports this August were higher by 4.0 percent in quantity and 5.9 percent in value due to higher imports of groundfish fillets, shrimp, and tuna. Compensating, in part, for the increases was a drop in the imports of canned salmon.

United States exports of processed fish and shellfish in August 1958 were higher by 28.1 percent in quantity, but were 10.0 percent lower in value as compared with July 1958. Compared with the same month in 1957, the exports in August 1958 were down by 56.8 percent in quantity and 52.4 percent in value. The exports this August as compared with the same month in 1957 continued the trends of the past year resulting from the very light packs of California sardines, mackerel, and anchovies.

United States Foreign Trade in Edible Fishery Products, August 1958 With Comparisons

Item	Quantity			Value		
	August		Year	August		Year
	1958	1957	1957	1958	1957	1957
	(Millions of Lbs.)			(Millions of $)		
Imports:						
Fish & shellfish: Fresh, frozen, & processed 1/. . .	91.0	87.5	837.0	25.2	23.8	248.4
Exports:						
Fish and shellfish: Processed only 1/ (excluding fresh & frozen)	2.5	5.7	69.7	0.9	2.1	16.8

1/Includes pastes, sauces, clam chowder and juice, and other specialties.

* * * * *

GROUNDFISH FILLET IMPORTS, OCTOBER 1958: United States imports of cod, haddock, hake, pollock, cusk, and ocean perch fillets (including blocks) during October 1958 totaled 19.9 million pounds--an increase of 784,000 pounds, or 4 percent, compared with the same month of last year. Although shipments from Canada dropped 3 percent below October of 1957, it still ranked first in volume as supplier with 15.7 million pounds.

During the first ten months of 1958, imports of groundfish fillets (including blocks) amounted to 130.9 million pounds. This was still a gain of 5 percent compared with the same period of 1957. Imports from Canada accounted for 73 percent of the total, followed by Iceland with 13 percent, and Denmark with 7 percent. Imports from nine other countries made up the remaining 7 percent.

The quota of groundfish and ocean perch fillets and blocks permitted to enter the United States at $1\frac{1}{8}$ cents per pound in calendar year 1958 is 35,892,221 pounds, divided into a quarterly quota of 8,973,055 pounds. The quota for the calendar year 1957 amounted to 37,375,636 pounds. Imports during any quarter in excess of the established quarterly quota enter at a duty of $2\frac{1}{2}$ cents a pound.

Note: See Chart 7 in this issue.

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IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA: The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1958 at the $12\frac{1}{2}$-percent rate of duty has been established as 44,693,874 pounds. Any imports in excess of this established quota will be dutiable at 25 percent ad valorem.

Imports from January 1-October 31, 1958, amounted to 42,349,036 pounds, according to data compiled by the Bureau of Customs. This leaves a balance of 2,344,838 pounds of the quota which may be imported during the balance of 1958 at the $12\frac{1}{2}$-percent rate of duty. Last year from January 1-November 2 a total of 34,923,285 pounds had been imported.

Wholesale Prices, November 1958

Wholesale prices for selected edible fishery products in mid-November 1958 continued to fall off slightly from the two preceding months, but remained higher than for the same month in 1957. The November 1958 edible fish and shellfish (fresh, frozen, and canned) wholesale price index (128.6 percent of the 1947-49 average) was down by 0.8 percent from the previous month, but was up 6.1 percent from November a year ago.

October 1958 prices for the drawn, dressed, and whole finfish subgroup were down 2.3 percent as compared with a month earlier. From October to November prices rose for large drawn haddock (up 2.2 percent) and Lake Superior whitefish (up 11.5 percent). These increases were offset by lower prices for the other fresh-water varieties and frozen halibut and salmon. When compared with November 1957, the subgroup index in November 1958 was higher by 19.6 percent due to higher prices for all the subgroup items except fresh whitefish at New York City.

The fresh processed fish and shellfish subgroup index for November 1958 was down by 1.5 percent from October due to lower prices for fresh haddock (down 4 percent) and fresh shrimp (down 2.4 percent). The index in November 1958 as compared with November 1957 was lower by 2.5 percent due to a 7.4-percent drop in fresh shrimp prices at New York. Higher prices for fresh haddock fillets (up 3.2 percent) and fresh shucked oysters (up 2.1 percent) failed to offset the lower shrimp price.

The November 1958 index for the frozen processed fish and shellfish subgroup was the only one to show a slight increase (1.8 percent) over the preceding month, and it was due to the rise in frozen shrimp prices at Chicago. From November 1957 to November 1958 prices for selected frozen processed fish and shellfish increased 8.3 percent. All the items were priced higher (haddock up 22.7 percent) in November 1958 than in the same month a year earlier.

Canned fishery products primary broker prices in November 1958 were down slightly (0.7 percent) from October, but were higher by 1.1 percent than for November 1957. From October to November this year lower prices for canned pink salmon and California sardines were responsible for the over-all decline. As compared with November 1957, wholesale canned fish prices were higher in November 1958 for Maine sardines (up 27.6 percent from abnormally low prices in November 1957) and for tuna (up 4.0 percent), and prices were lower for pink salmon (6.5 percent) and California sardines (3.5 percent). The market remained firm for the below-average pack of Maine sardines and for salmon. But a heavy pack and imports of tuna and a large pack of California sardines continued to depress the market for these two products. The prospects for the market for the relatively large pack of California sardines (about 2.1 million cases) was poor.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, November 1958 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices1/ ($)		Indexes (1947-49=100)			
			Nov. 1958	Oct. 1958	Nov. 1958	Oct. 1958	Sept. 1958	Nov. 1957
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					128.6	129.6	130.1	121.2
Fresh & Frozen Fishery Products:					147.9	149.2	150.0	136.1
Drawn, Dressed, or Whole Finfish:					156.5	160.2	158.1	130.8
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.15	.15	152.3	149.0	151.9	142.4
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.34	.34	105.2	106.2	113.2	96.4
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.78	.81	177.0	182.6	174.2	143.8
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.73	.65	179.7	161.1	161.1	142.5
Whitefish, L. Erie pound or gill net, rnd., fresh	New York	lb.	.75	.90	151.7	182.0	200.2	156.7
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.50	.59	117.3	138.4	140.7	114.9
Processed, Fresh (Fish & Shellfish):					138.7	140.8	143.8	142.2
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.48	.50	163.3	170.1	158.2	158.2
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.81	.83	128.0	131.1	138.2	138.3
Oysters, shucked, standards	Norfolk	gal.	6.00	6.00	148.5	148.5	148.5	145.4
Processed, Frozen (Fish & Shellfish):					135.5	133.1	134.7	125.1
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.42	.42	108.6	108.6	107.3	100.8
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.41	.41	127.1	127.1	124.0	103.6
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.30	.30	120.8	120.8	116.8	110.8
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.86	.83	132.7	128.5	133.5	130.0
Canned Fishery Products:					101.1	101.8	101.9	100.0
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	21.50	21.75	112.2	113.5	109.6	120.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.95	11.95	86.2	86.2	86.2	82.9
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 24 cans/cs.	Los Angeles	cs.	4.15	4.30	96.9	100.4	123.7	100.4
Sardines, Maine, keyless oil, No. 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	8.22	8.22	87.5	87.5	87.5	68.6

1/ Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

FOREIGN

International

FOOD AND AGRICULTURE ORGANIZATION

MALAYA BECOMES MEMBER OF INDO-PACIFIC FISHERIES COUNCIL:

The Federation of Malaya on September 3, 1958, informed the Food and Agriculture Organization that it had accepted the Agreement for the Establishment of the Indo-Pacific Fisheries Council.

In accordance with the provisions of Article IX of the Agreement, Malaya became a party to that Agreement on September 15, 1958, date of receipt of the instrument of acceptance.

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U. S. GOVERNMENT APPOINTS LIAISON OFFICER FOR SECOND WORLD FISHING VESSEL CONGRESS:

A. W. Anderson, Assistant Director, U. S. Bureau of Commercial Fisheries, Washington 25, D. C., has been appointed by the Government of the United States to be the official liaison officer for the forthcoming second World Fishing Boat Congress, sponsored by the Food and Agriculture Organization (FAO). The Congress will be held at FAO headquarters in Rome, April 5-10, 1959. Naval architects, boat builders, marine engineers, and others wishing to attend the Congress should apply to A. W. Anderson for details.

More than 40 governments have now appointed liaison officers to the Congress which, it is anticipated, will be attended by several hundred participants.

"These will include not only government representatives but also naval architects, boat builders and designers, marine engineers, boat owners, skippers, and fishermen from all the leading fishing nations," stated the Chief Naval Architect of FAO and Secretary of the forthcoming Congress, speaking at FAO headquarters late in October 1958.

The Congress will take "performance" for its theme and will deal with fishing tactics, construction of fishing vessels, sea behavior of fishing boats, and productivity of boats.

The papers and discussions at the Congress are expected to yield much practical design data, cost particulars, operational experience, and other information which will help designers in all parts of the world to build more efficient fishing boats.

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MANY EARLY REGISTRATIONS RECEIVED FOR SECOND WORLD FISHING VESSEL CONGRESS:

By November 1958 about 200 private consulting naval architects, boat builders, fishing boat operators, and others had sent in their preliminary registration for the Second World Fishing Vessel Congress. Organized by the Food and Agriculture Organization, it will be held April 5-10, 1959, in Rome at FAO headquarters. As of November 1958, registrations of Government delegates had not been received, but they are expected later. Judging from the experience of similar meetings arranged by FAO and preliminary interests, it is believed that participants in this Congress may total 500.

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International (Contd.):

INTERNATIONAL WHALING COMMISSION

INTERNATIONAL WHALING CONVENTION AMENDMENTS ENTER INTO FORCE:

Certain amendments to the schedule of the International Whaling Convention of 1946 were adopted at the 10th meeting of the International Whaling Commission, The Hague, June 23-27, 1958. The amendments adopted were to paragraphs 6 (1), 6 (2), 8 (a), and 8 (c) of the schedule to the Convention. Amendments 6 (1) and 6 (2) entered into force October 6, 1958. Amendments to paragraph 8 (a) and (c) have not yet entered into force, according to the November 10, 1958, issue of the U. S. Department of State Bulletin.

INTERNATIONAL NORTH PACIFIC FISHERIES COMMISSION

FIFTH ANNUAL MEETING HELD IN TOKYO:

The International North Pacific Fisheries Commission held its fifth annual meeting in Tokyo, Japan. The three-nation treaty organization includes Japan, Canada, and the United States. After preliminary meetings of several committees, the plenary session of the Commission itself was held from November 4-10, 1958.

The effect of Japanese high-seas gillnet fishing for salmon on the stocks originating in North American streams highlighted the agenda. Other agenda items concerned the halibut, herring, and king crab fisheries of Alaska and the Northwest.

Japan in signing the Convention agreed to abstain from fishing halibut, herring, and salmon of North American origin for five years. The "abstention clause" states that Japan will abstain fishing those three species in the eastern North Pacific, and Canada from catching salmon in the east Bering Sea. The United States is not restricted. The five-year period was up at the meeting. The decision that had to be made by the Commission was whether these three species should continue to qualify for further abstention. Abstention has been based on the principle that these three species are fully utilized by North American fishermen. No changes were approved at this meeting.

Another point that came up for discussion was the moving of the provisional salmon line westward. This line now runs north and south along the 175th meridian west longitude.

On November 4 the Commission instructed its protocol committee to investigate further whether more restrictions are needed on Japanese salmon fishing in the North Pacific.

The salmon fishing boundary line was not changed at the meeting. The United States proposed the present boundary be shifted toward Japan up to 175 degrees east longitude to prevent the Japanese from fishing east of that line. The present line (175 degrees west longitude) ratified in 1953 will continue in force for at least one more year. It restricts Japanese fishermen from fishing east of the line.

The Commission said that "extensive intermingling of salmon from the two continents exists over a broad area extending from 170° east longitude to 160° west longitude. However, sufficient quantitative information on the extent of intermingling has not been determined by commission investigations."

A Russian report on salmon research was presented to the Commission although Russia is not a member of the Commission. A Soviet observer at the meeting expressed the hope that his country would be invited to join the pact between Canada, Japan, and the United States.

Fifty delegates from the United States, Canada, and Japan attended the sessions of the Biology and Research Committee of the Commission prior to the general meeting. Full plenary sessions of the Commission began on November 4.

The sixth annual meeting of the Commission is scheduled for Seattle, Wash., starting November 2, 1959.

International (Contd.):

The sixth annual meeting of the Commission is scheduled for Seattle, Wash., starting November 2, 1959.

TRADE AGREEMENTS

ICELANDIC-EAST GERMAN TRADE AGREEMENT INCLUDES FISH:

Iceland has concluded a new trade agreement with East Germany, providing for an increase of some 25 percent in the level specified in the 1957 agreement (renewed for 1958). The East Germans are to supply US$5,304,000 worth of a wide variety of machinery, electrical and chemical goods, and consumer articles, the largest single category ($630,000) being fishing boats and gear. Iceland will supply fish, meat, and wool, with the largest item being frozen fillets ($2.8 million), an increase in both volume and price from the $2.4 million in the previous agreement.

The Icelanders have been straining to increase shipments to East Germany to pay for twelve 250-ton fishing vessels. The U.S.S.R. agreed in August 1958 to take over the financing of this $3-million purchase on longer credit terms than East Germany could afford. The Icelanders, who had already paid over $250,000 towards the vessels, found themselves in a surplus position with East Germany--the only clearing country with which Iceland is currently a creditor.

Because Iceland does not recognize the German Democratic Republic, the agreement is negotiated by the Icelandic Barter Trade Association with East Germany's Chamber of Commerce.

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NORWAY-RUSSIA THREE-YEAR AGREEMENT INCLUDES FISH:

A new trade agreement signed in Oslo on October 28, 1958, for the period January 1, 1959-December 31, 1961, between Norway and the Soviet Union includes fish. The agreement replaces the three-year agreement which expires at the end of 1958.

Under the agreement Norway will export these fishery products: hardened marine fats, salt herring, frozen fish fillets, and vitamin concentrates. Norwegian imports from Russia do not include any fishery products. The annual value of trade in both directions is estimated at Kr. 250 million (US$35 million). Annual fishery commodity deliveries from Norway to the Soviet Union 1959-61 are: salted herring 25,000 metric tons; frozen herring and fish fillets 10,000 tons. The previous three-year agreement contained fewer commodities and the value was estimated at about Kr. 215 million (US$30.1 million) annually.

The major changes concerning fishery products in the new three-year agreement is the reduction by 50 percent in Norwegian exports of salt herring or from 50,000 metric tons to 25,000 metric tons.

UNITED NATIONS

LAW OF THE SEA CONVENTION CLOSED FOR SIGNATURE:

Forty-nine nations have signed the Convention on the High Seas. This was one of four international conventions which were adopted by the United Nations Conference on the Law of the Sea in Geneva on April 27, 1958, and were open for signature through October 31, 1958.

The Convention on the Continental Shelf has been signed by 46 countries; the Convention on the Territorial Sea and the Contiguous Zone by 44 countries; and the Convention on Fishing and Conservation of the Living Resources of the High Seas by 37 countries. The Optional Protocol of Signature, which also emerged from the conference, has 29 signatory nations.

Signatures on all instruments adopted by the Law of the Sea Conference must be followed by ratification. Countries which have not signed may still accede to the Conventions at any time. Twenty-two ratifications or accessions are required for any of the Conventions to enter into force. No nation has yet ratified.

Convention on the High Seas: Provides for freedom of the high seas and regulates practices on the high seas, including matters as prevention of pollution of waters by radioactive waste and jurisdiction over vessels.

International (Contd.):

It has been signed by: Afghanistan, Argentina, Australia, Austria, Bolivia, Bulgaria, Byelorussia, Canada, Ceylon, China, Colombia, Costa Rica, Cuba, Czechoslovakia, Denmark, Dominican Republic, Finland, France, German Federal Republic, Ghana, Guatemala, Haiti, Holy See, Hungary, Iceland, Indonesia, Iran, Ireland, Israel, Lebanon, Liberia, Nepal, Netherlands, New Zealand, Pakistan, Panama, Poland, Portugal, Romania, Switzerland, Thailand, Tunisia, Ukraine, U.S.S.R., United Kingdom, United States, Uruguay, Venezuela, and Yugoslavia.

Convention on the Continental Shelf: Deals with the seabed that constitutes the prolongation of a continent, and regulates the exploitation and exploration of resources such as offshore oil or pearl-bearing oysters.

It has been signed by: Afghanistan, Argentina, Australia, Bolivia, Byelorusria, Canada, Ceylon, Chile, China, Colombia, Costa Rica, Cuba, Czechoslovakia, Denmark, Dominican Republic, Ecuador, Finland, German Federal Republic, Ghana, Guatemala, Haiti, Iceland, Indonesia, Iran, Ireland, Israel, Lebanon, Liberia, Nepal, Netherlands, New Zealand, Pakistan, Panama, Peru, Poland, Portugal, Switzerland, Thailand, Tunisia, Ukraine, U.S.S.R., United Kingdom, United States, Uruguay, Venezuela, and Yugoslavia.

Convention on the Territorial Sea and the Contiguous Zone: Proclaims the juridical character of territorial waters, sets out criteria for delimiting the territorial sea (the Geneva Conference did not agree on a maximum width for the territorial sea), establishes specific rules for the right of innocent passage of ships through territorial waters, and sets forth conditions in which that right can be exercised or suspended. In a section on contiguous zones, it states the right of each nation to exercise fiscal, immigration, customs, and sanitary controls within a zone extending not more than 12 miles.

This Convention has been signed by: Afghanistan, Argentina, Australia, Austria, Bolivia, Bulgaria, Byelorussia, Canada, Ceylon, China, Colombia, Costa Rica, Cuba, Czechoslovakia, Denmark, Dominican Republic, Finland, Ghana, Guatemala, Haiti, Holy See, Hungary, Iceland, Iran, Ireland, Israel, Liberia, Nepal, Netherlands, New Zealand, Pakistan, Panama, Portugal, Romania, Switzerland, Thailand, Tunisia, Ukraine, U.S.S.R., United States, Uruguay, Venezuela, and Yugoslavia.

Convention on Fishing and Conservation of the Living Resources of the High Seas: Establishes regulations on the conservation of fisheries, lays down rules under which measures promulgated by one nation are applicable to other countries, and sets out arbitration procedures.

The Convention has been signed by: Afghanistan, Argentina, Australia, Bolivia, Canada, Ceylon, China, Colombia, Costa Rica, Cuba, Denmark, Dominican Republic, Finland, France, Ghana, Haiti, Iceland, Indonesia, Iran, Ireland, Israel, Lebanon, Liberia, Nepal, Netherlands, New Zealand, Pakistan, Panama, Portugal, Switzerland, Thailand, Tunisia, United Kingdom, United States, Uruguay, Venezuela, and Yugoslavia.

Optional Protocol of Signature: Deals with the compulsory settlement of disputes.

It has been signed by: Austria, Bolivia, Canada, Ceylon, China, Colombia, Costa Rica, Cuba, Denmark, Dominican Republic, Finland, France, German Federal Republic, Ghana, Haiti, Holy See, Indonesia, Israel, Liberia, Nepal, Netherlands, New Zealand, Panama, Portugal, Switzerland, United Kingdom, United States, Uruguay, and Yugoslavia. (United Nations news release, November 4, 1958.)

Argentina

NEW JAPANESE-ARGENTINE FISHING FIRM TO SUPPLY TUNA TO CANNERS: An agreement was signed on November 18, 1958, between the Mar del Plata Chamber of Fish Industries and a Japanese-Argentine fishing enterprise, for a regular supply of tuna to Mar del Plata canneries.

Argentina (Contd.):

The new fishing firm is bringing from Japan a vessel specially equipped for tuna fishing. The vessel, using Mar del Plata as its home port, will make one fishing trip each month. A catch of about 150 tons a trip is expected. All the landed tuna will be processed by Mar del Plata canneries. The article (which appeared in La Nacion of November 19, 1958) expresses the hope that canned tuna from these operations may eventually be exported to the United States (United States Embassy in Buenos Aires, November 19, 1958).

Australia

MEASURES TAKEN TO CONSERVE SPINY LOBSTER STOCKS:

Measures to conserve the stocks of spiny lobsters in Australian waters are being taken by the Commonwealth Government. An increased demand for spiny lobster tails for export has led to a rapid rise in the number of lobster fishermen and depletion of stocks in State territorial waters.

As the shellfish move into Commonwealth territorial waters, they are protected by two new conservation measures--a minimum legal length of $4\frac{1}{4}$ inches and a closed season from September 1 to October 15 each year.

These regulations aim at giving the spiny lobsters some protection during the period in which the females are carrying eggs and also aim at ensuring that they are not taken before reaching a size giving a reasonable return in weight of meat. A spiny lobster with a carapace length of $4\frac{1}{4}$ inches would weigh on the average about $1\frac{1}{4}$ pounds--(Australian) Fisheries Newsletter, September 1958.

* * * * *

SHRIMP INDUSTRY TRENDS:

Since 1947, a great change has taken place in Australian commercial shrimp fishing. With the location of shrimp grounds off the coast of New South Wales and Queenland and, to a lesser extent, in Western Australia, the industry has received a considerable boost. Catches have allowed sufficient for home consumption and for export.

Of the 30 species known to exist in Australian waters, only six are of importance to the industry. They are the king prawn; Western Australian king prawn; tiger prawn; banana or white prawn; greentail or greasyback prawn; and the school prawn.

Shrimp trawling in Australia is done with otter-trawl gear by day in inshore waters, seldom deeper than 30 fathoms. With one exception, where the vessel is rigged with fore and aft gallows, the trawl is shot and hauled over the stern. At the end of each haul the cod end of shrimp is lifted over the side with the derrick, generally on to the afterdeck, or contents spilled on to a sorting table built to a height convenient for sorting in a standing position. Mud and sand are washed out prior to lifting from the sea.

After sorting, the shrimp are carefully washed in tanks supplied with clean running sea water, then put in an insulated fish hold with crushed ice. Sometimes coarse salt is

scattered among the shrimp as they are iced down. On many boats the shrimp are cooked after washing and cooled quickly before being placed in the hold.

Trawler crews consist of from 2 to 4 members, depending on vessel size and weight of catch taken, and upon whether the catch is cooked at sea or iced raw.

Trawling bottom is usually sand, sand and sponge, sand and shell, mud, or sand and mud, while average trawling speed is around 2 knots. A straight course is not necessarily kept while trawling, the vessel being maneuvred to avoid known obstacles on seabed; to keep clear of other boats; or to turn on a reciprocal course when working a concentration of shrimp.

At day's end most trawling vessels return to port with the catch where it is weighed, cooked (if raw), and packed with crushed ice for consignment to market, or held for further processing before market. At some ports shrimp are left raw for market. Some trawlers, however, remain on grounds for 2 to 3 days before returning to port with the catch. This happens in the Hervey Bay (Queensland) fishery, the locale of some of the biggest shrimp catches at present. Here king and tiger prawns at least 12 inches long or more are being caught in about 25 fathoms.

A very satisfactory type of winch is installed in the better-class shrimp trawler. It is chain or belt-driven through a power take-off from the main engine. In the short history of Australia's ocean shrimp fishery a highly efficient overhead type of hauling gear has evolved. Peculiar to Australian vessels, it is best situated just abaft of amidships.

Vessels which had been built for Danish seining, for trapping fish or spiny lobsters, or for line fishing were rigged for participation in the newly discovered shrimp fisheries in the early stages.

However, with the increase of interest in ocean shrimp trawling, vessels have been specifically built for this purpose, powered with a Diesel engine, and equipped with ship-to-ship and ship-to-shore radio. Two are provided with echo-sounders. Australian trawlers range in size from a single-manned 17 ft. 6 in. decked boat to trawlers of about 70 feet manned by a crew of four.

Some indication of Australia's offshore shrimp fisheries can be obtained from table 1.

Table 1 - Australia's Shrimp Landings 1/, 1956/57

State	Quantity	Value
	1,000 Lbs.	US$1,000
Queensland	2,500	784
New South Wales	2,386	1,049
Western Australia	189	74
Total	5,075	1,907

1/As landed, including raw headless and cooked headless.

Australia's total shrimp exports for 1956/57 amounted to 317,377 pounds, of which 224,000 pounds was raw shrimp (table 2), and 93,000 pounds cooked headless (mostly to New Guinea and Caledonia).

Table 2 - Australia's Raw Headless Shrimp Exports by Country of Destination, 1956/57

Country of Destination	Raw	
	Head on	Headless
	(1,000 Lbs.)	
United States	-	129
Honolulu	-	83
New Guinea	2	6
New Caledonia	2	2
Other	1/	-
Total	4	220

1/Less than 1,000 pounds.

Both landings and exports for 1957/58 were much greater. (World Fishing, October 1958).

* * * * *

SPINY LOBSTER INDUSTRY, FISCAL YEARS 1956/57-1957/58:

Exports: Australian exports of both tails of and boiled whole spiny lobsters--6,584,470 pounds--for fiscal year 1957/58 (July 1957-June 1958) were at a record level and 1,633,739 pounds more than in 1956/57 fiscal year. Tail exports of 5,836,120 pounds were the highest ever; exports of boiled whole of 748,350 pounds were also a record. While tail exports increased by about 26 percent, exports of whole more than doubled as compared with the previous year. Shipments to the United States and dependencies were 6,443,750 pounds or 97.9 percent of total exports of tails and whole boiled.

In addition to increased exports, good prices were received for most consignments to the United States, even though prices on that market dropped. The average price for Western Australian shipments, approximately 8s. 3d. (93 U. S. cents) a pound f.o.b., was a decrease from the previous year's average price. Western Australian consignments accounted for 79 percent of total Australian shipments.

Table 1 - Australian Exports of Spiny Lobster Tails and Boiled Whole

Countries	1957/58		1956/57	
	Tails	Whole	Tails	Whole
	(1,000 Lbs.)			
United States	5,647	638	4,457	266
Hawaii	158	-	165	-
Canada	10	33	-	9
Singapore	12	67	6	40
Persian Gulf	8	-	1	-
New Guinea & Pacific Is.	1	6	-	6
Other	-	4	-	-
Total	5,836	748	4,629	321

In the absence of more precise information as to the value of exports from other States, the average for Western Australia, as in past years, has been applied to all shipments. However, as some South Australian tails normally yield higher prices, this average price may be too low. Probably final figures when available will show that dollar earnings will exceed US$6 million for 1957/58, almost 16 percent more than the previous fiscal year.

In Western Australia midget tails accounted for 28 percent of total exports, smalls 30 percent, mediums 22 percent, large 15 percent, and jumbo 5 percent. Final grade details from other States are not yet available, but on present indications it would seem that gradings will approximate those of 1957/58.

Although United States imports of Australian spiny lobsters increased considerably in 1957 as compared with 1956, total imports from all countries were up in 1957. However, Australia retained its position as number three on the list of major suppliers of all lobsters. Exports of lobsters from Canada and spiny lobsters from the Union of South Africa decreased in 1957 as compared with 1956.

Table 2 - Australian Exports of Spiny Lobsters by States, 1956/57-1957/58

State	1957/58		1956/57	
	Tails	Whole	Tails	Whole
	(1,000 Lbs.)			
Tasmania	174	110	167	65
South Australia	1,048	88	1,034	184
West Australia	4,614	550	3,428	73
Total	5,836	748	4,629	322

United States imports from New Zealand once more were up from the previous year--3.2 million pounds in 1955, rose to 3.9 million pounds in 1956, and to 4.2 million pounds in 1957.

Production: Production in New South Wales is down and is the lowest for some years. In Victor-

Australia (Contd.)

ia, production is also down slightly. Tasmania's production has increased slightly and output is second only to the record year 1954/55. South Australian production is also up and represents a new record for this State. The same position applies in Western Australia (table 4).

Table 3 - United States Imports of Lobsters[1/], Calendar Years 1956-57

Country of Origin	1957	1956
	(1,000 Lbs.)	
Canada	22,218	22,484
Union of South Africa	6,908	7,025
Australia	5,369	4,688
Cuba	4,249	4,303
New Zealand	4,204	3,852
Mexico	2,159	1,955
Bahamas	1,965	1,591
Other countries	3,327	1,844
Total	50,399	47,742

1/ From countries other than Canada consist mostly of spiny lobster tails.

The New South Wales Superintendent of Fisheries has advised that the drop in that State's production was due almost entirely to a substantial fall in the catch taken by inshore fishermen, that is, fishermen licensed to operate in State territorial waters.

The Director of Fisheries and Game in Victoria has written that while there has been a slight decrease in Victorian production, no great significance should be placed on this fact and, of course, production in this State has been almost static for the last three years.

Table 4 - Australian Spiny Lobster Production[1/], 1951/52-1957/58

Years	New South Wales	Victoria	Tasmania	South Australia	West Australia	Total
	(1,000 Lbs.)					
1957/58	384	635	2,985	4,460	2/ 12,000	20,464
1956/57	473	689	2,579	4,385	10,763	18,889
1955/56	438	614	2,802	4,000	10,530	18,384
1954/55	510	832	3,256	4,294	10,906	19,798
1953/54	576	1,163	2,527	3,850	9,224	17,340
1952/53	543	831	2,770	3,500	8,100	15,744
1951/52	685	623	2,242	2,700	8,344	14,594

1/ Live weight. 2/ Estimated.

The Tasmanian Secretary for Fisheries has stated that the increase in catch in Tasmania was due to two factors: firstly, quite a number of new boats worked the fishery last season and, secondly, weather conditions were more suitable than the previous year.

The Chief Inspector of Fisheries and Game in South Australia has written that the record year in that State was achieved notwithstanding the fact that a total closed season against fishing during October, was enforced for the first time during the year.

The Western Australian Superintendent of Fisheries has advised that the increase in production was due to the increased number of fishermen operating in the fishery.

Note: Also see Commercial Fisheries Review, March 1958 p. 41.

Brazil

WHALING INDUSTRY TRENDS:

The Brazilian whaling company which was taken over by Japanese interests early in 1958 had captured 104 whales as of September 1, 1958, and a take of 200 whales was likely before the end of the season. The Japanese have added new equipment to the plant which now has an annual capacity of 9,000 tons, states an October 7, 1958, dispatch from the United States Consul in Pernambuco.

The reactivation of the Brazilian whaling company with the help of Japanese capital and know-how has provided more employment and provided low-cost whale meat for human consumption. In addition, the operation provides an increasing volume of whale oil which helps to reduce the drain on scarce foreign exchange. It is estimated that Brazil consumes about 20,000 barrels of whale oil annually.

Canada

FISHERIES MINISTER ACCEPTS NEW RESEARCH VESSEL:

The New ultra modern $1,750,000 fishery research vessel A. T. Cameron was officially accepted by the Canadian Fisheries Minister on October 17 at Montreal. Built along trawler lines, the 177-foot vessel is Diesel-powered with a speed of 12 knots, and her hull has been strengthened for navigation in ice. She is fitted with up-to-date equipment and gear, as well as for oceanographic, hydrographic, and survey work. Instead of a large cargo fish hold, which is usual on a trawler, she has an 1,800-cubic-foot insulated and refrigerated fish hold for unfrozen and frozen fish.

Depth-sounding and other electronic devices have been built into the vessel, which will have two radar sets to provide for long, intermediate, and short-range protection. When one set is being used in survey operations, the other can be used for safe navigation. The main electrically-welded hull of the vessel is steel, while the superstructure is of aluminum. There are three sets of recording echo-sounding equipment of different

Canada (Contd.):

types to ensure great accuracy at extreme, medium, and shallow depths.

The vessel has five laboratories.

Hydrographic laboratory will be equipped with instruments and facilities required for studying and mapping the forms and physical features of the contour of the sea bottom and of winds, tides, currents, and the like in order to relate these to the presence of sea organisms of importance to the fisheries.

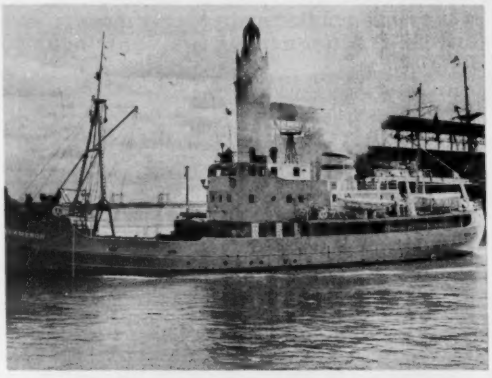


Fig. 1 - The A. T. Cameron passing the Victoria Basin tower in Montreal.

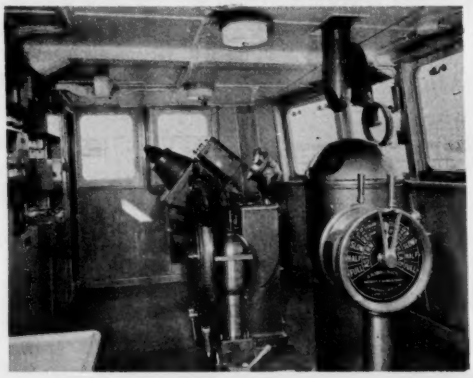


Fig. 2 - The wheel room (bridge) of the A. T. Cameron equipped with gyroscopic control.

Fig. 3 - The deck laboratory aboard the A. T. Cameron.

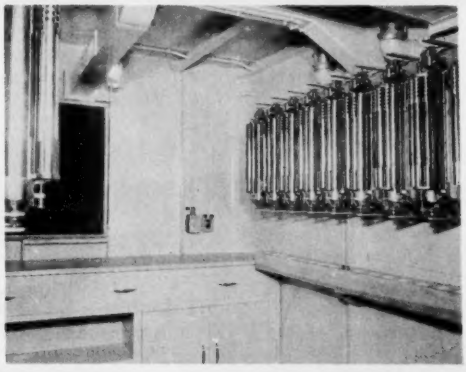


Fig. 4 - The hydrological laboratory aboard the A. T. Cameron.

Deck laboratory has devices and facilities for the taking of physical determination connected with specimens, some of which will be subjected to further study in other laboratories aboard ship or on shore.

Fish handling laboratory contains facilities for the sorting, dissecting, and anatomical examination of the freshly-caught fish. The required determinations include the measuring of the fish, the extraction of ear bones for age determination and gonads for sex, state of maturity and so on. Provision for microscopic examination of fish tissues is provided.

Chemical laboratory has instruments and facilities for carrying out chemical studies on water samples and bottom samples and possibly for doing simple chemical determinations on specimens taken from the sea. Such properties as the temperature, salinity, turbidity, and hydrogen ion concentration, also dissolved oxygen and the chemical characteristics of sea water are of importance in the exploration for the different species of fish and other organisms.

Canada (Contd.)

Plankton laboratory has space for storing and sorting plankton or the small free-floating organisms which form basic food of fishes. Among these floating organisms are found fish eggs and the very young of important fishes. Space is provided for microscopes and other laboratory equipment for the study and identification of these usually very small organisms.

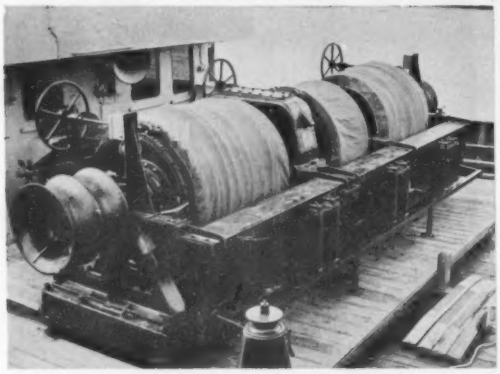


Fig. 5 - The drum used on the A. T. Cameron.

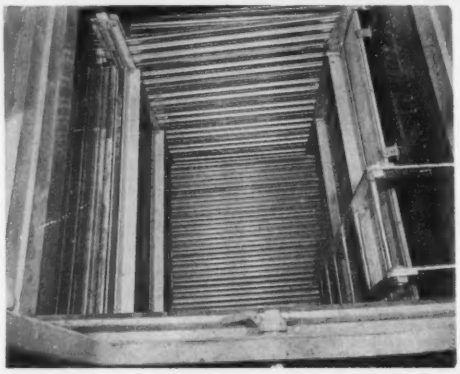


Fig. 6 - Storage space aboard the A. T. Cameron.

Deck equipment will include a special and most up-to-date trawl winch and three hydrographic winches, also a long-line hauler.

"Although fishing is among Canada's and the World's oldest industries, its mechanization and modernization is relatively recent; but, since the end of World War II, one fishing nation after another has invested heavily in modern scientifically-equipped fishing fleets and factory-ships and sent them to all oceans of the

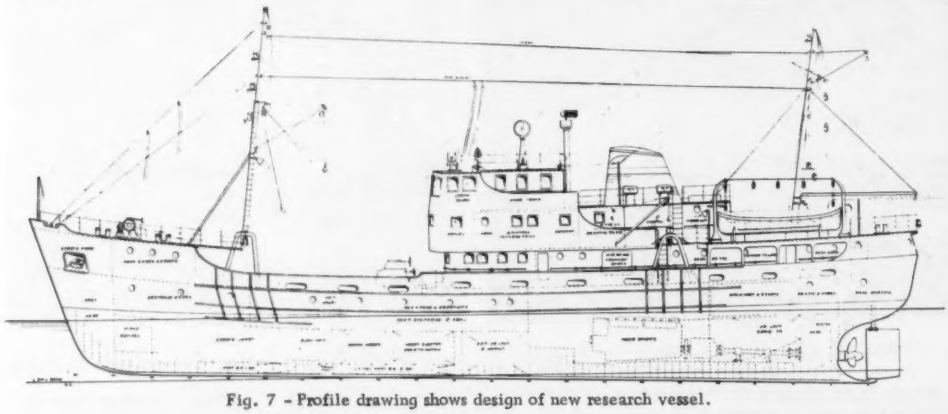


Fig. 7 - Profile drawing shows design of new research vessel.

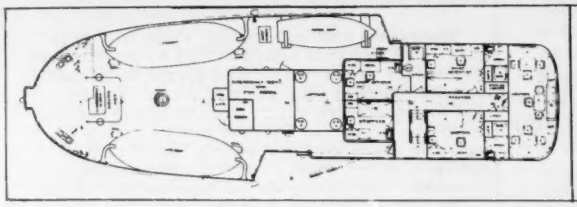
In his speech of acceptance, the Fisheries Minister pointed out: "Canada ranks sixth among fishing nations of the World. This is a high rank for a country with 17 million people. Our country has earned this distinction for two principal reasons. First, because of the resourcefulness and daring of our fishermen, and secondly, because of our proximity to very rich fishing grounds. There is no need to document these further. Our fishermen have earned a high and well-deserved reputation over the centuries and the Atlantic fishing banks off our shore were fished last year by highly modern and efficient fishing units of twelve nations.

Canada (Contd.):

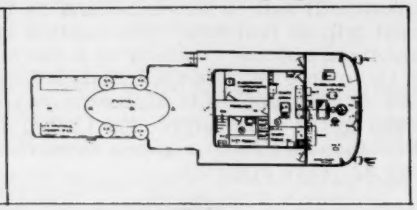
world, including our shores for rich harvests. Last year, the fishermen of 12 countries fished on the Grand Banks of Newfoundland and on the Nova Scotia Banks.

"Canada in the past has always enjoyed the advantage of nearness to rich fishing grounds and nearness to markets; but with the increase in size and efficiency of the fishing and processing units of our foreign partners and competitors, this advantage is fast being lost. As in other fields of endeavor, to remain in a competitive position, it will be necessary for us in Canada to further mechanize our operations and to make better and fuller use of our fishery products. This can only be done through research and through the directed development of our fishing industry.

"This modern research vessel which we are commissioning today, is in part Canada's answer to this changing scene... .



Deck



Wheelhouse

"This new and modern vessel places us in even a more commanding position to serve ourselves and our international partners in the field of oceanographic research... ."

Note: Also see Commercial Fisheries Review, August 1958 p. 60.

Costa Rica

COMMERCIAL FISHING IN GULF OF NICOYA RESTRICTED:

Commercial fishing and the use of mechanically-drawn nets in the interior portions of the Gulf of Nicoya are banned by Costa Rican Law No. 14, which went into effect on October 30, 1958. The law was published in La Gaceta on the same date. Commercial fishing permits for the closed area previously granted by the Minister of Agriculture and Industries are automatically cancelled.

The closed area includes the waters inside an imaginary line extending from "La Panta" of the peninsula on which the port of Puntarenas is located to the Isle of Cedros and from there to the peninsula of Nicoya.

The new law reserves the closed area for amateur fishermen, domestic consumption, and scientific research.

Both Costa Rican sport and commercial fishermen have been concerned for some time with the drastic drop in the fish resources of the Gulf of Nicoya. The area formerly supported heavy commercial and game fish populations.

Cuba

NEW COD-FISHING TRAWLER RENAMED:

An official ceremony was held in Cuba on October 15, 1958, to re-name the German-built cod trawler Arktis, acquired by the Cuban National Fishreies Institute with the financial assistance of the National Bank of Cuba and the Economic and Social Development Bank, to stimulate Cuban fishing activities. The vessel was re-christened the Codfisher I (Bacaladero 1).

Cuba (Contd.)

The vessel reportedly makes 14 knots and has modern trawling gear, including winches and other machinery. It is said to have four power plants, of which three are European-designed Diesels. The crew of 22 is mostly Spanish and German seamen, but they will gradually be replaced by Cuban fishermen, some of whom will sail to Newfoundland on the next trip as trainees. The captain is a Spaniard and the engineer is a German. A German expert in the construction of cod-drying tunnels is also expected in Cuba in the near future, the United States Embassy in Havana reports in an October 22, 1958 dispatch.

Denmark

DANISH MINISTER COMMENTS ON FAROE ISLANDS FISHING LIMITS:

The Danish Minister of Finance (also Chairman of the Danish Delegation that visited Great Britain and the Faroe Islands to discuss the proposed extension of fishing limits from 3 to 12 miles by the Faroese) commented on the problem from the standpoint of the Faroese in an article published in a Danish newspaper on October 13, 1958.

In recent decades the export of fish from the Faroe Islands has represented about 95 percent of all exports. Under these circumstances it is natural that the question of fishing limits in Faroese waters as well as elsewhere in the North Atlantic Ocean where the Faroese engage in fishing is of economic and political importance to the people of these Islands. The political importance is enhanced by the fact that Iceland extended her fishing limits to 12 miles a few months ago and just shortly before elections were held on representation in the Lagting, the local Government of the Faroe Islands.

Before the first World War, when the total Faroese catch amounted to 20,000-25,000 metric tons annually, about half came from Icelandic waters. In the beginning of the 1920's the total catch had increased to 35,000-40,000 tons, the major part of which was caught in Icelandic waters, while at the same time the catch in home waters had shrunk to 4,000-5,000 tons. Toward the end of that period the Faroese began to fish in Greenland waters. This did not influence the extent of their operations in Icelandic waters. Fishing in Faroe Islands waters further declined to a few thousand tons annually. During the favorable period about 1930, 50,000 tons were caught in Icelandic waters and 20,000 tons in Greenland waters. Toward the end of the 1930's fishing in Icelandic waters declined, whereas fishing in Greenland waters and in the Barents Sea assumed growing importance.

After World War II the total catch gradually increased and in the period between 1952 and 1956 the average catch amounted to 80,000 tons, of which 13 percent were caught in Faroese waters and 22 percent in Icelandic waters. By far the major catches were made in Greenland waters (41 percent) and in the Barents Sea (23 percent). In recent years, however, fishing in Faroese waters has increased somewhat, but still out of the 90,000 tons which are now caught annually, barely 15 percent is caught in domestic waters. These figures do not include the many tons of herring caught north of the Faroes.

The rather limited extent to which fishing is carried on in Faroe Island waters by the Faroese themselves should not be interpreted as an indication that there are not any fish there. The fact is that the total catch of fish--not including herring and ocean perch--in Faroese waters during the past five years averaged nearly 70,000 tons annually, of which about 15 percent was caught by the Faroese. Practically all the balance was caught by British vessels, or on an average of 41 and 37 percent, respectively, Norway and Germany are the only other two countries that have operated in Faroese waters and that they have done on a minor scale. There are in all 1,700 small craft engaged in Faroese fishing, most of which are equipped with motors. However, the greater part of domestic fishing is carried on by larger motor vessels. The fact is that the Faroe Islands export markets prefer primarily large cod, salted and/or dried. Unless large meshes are used, trawling produces a greater variety of fish, including smaller fish. Owing to the uneven bottom of the waters surrounding the Faroes, fishing by means of a trawl net is a costly affair since the equipment is frequently damaged. Therefore (in a paradoxical attempt to economize), the British are chiefly using trawlers which are too small or in too poor a condition to compete with the modern trawlers in the northern waters.

Before World War II the Faroe Islands fishing fleet consisted, in addition to the crafts already named, of about 150 sloops and schooners and about 10 steam trawlers. Four trawlers and 30 schooners were lost (as well as the lives of many of the Faroese fishermen).

After World War II the Faroe Island fishing fleet was augmented by a number of old obsolete trawlers purchased from aboard. Much money was spent in the 1950's to modernize older steam trawlers and to provide for larger and more modern Diesel trawlers. Up to now 5 new vessels of this type have been procured and two have been modernized. In addition, there exist 3 older Diesel trawlers in good condition, while 3 new trawlers are under construction. It is furthermore under consideration at the moment to build an additional trawler. It is a great problem in the Islands as to how provision shall be made for the construction of additional trawlers in order that the many Faroese, who have been working in Iceland in recent years, may find occupation at home. This might be accomplished by the construction of smaller craft, as there is considerable interest in the Islands for the type of small steel craft now beginning to operate in Danish waters.

Denmark (Contd.):

The existing legislation concerning the establishment of a Mortgage Credit Institution which may finance half of the sum needed for new vessels, constitutes the basis for the modernization of the fishing fleet.

Under these circumstances it may seem surprising that the Faroese are attaching such great importance to an extension of their fishing limits. In this connection the Minister points toward the fact that a recognition of the 12-mile limit in Iceland will cause a reduction in Faroe Island's fishing in Icelandic waters and cause vessels of other nations, especially the British, to seek fishing grounds in Faroese waters. Therefore, the Minister finds it quite understandable that the Faroese in principle assume the standpoint that if the 12-mile limit is to be introduced in Iceland a corresponding fishing territory must be established around the Faroes. This is so much the more natural because the Icelandic action takes place at a time when fishing around the Faroes is increasing. One cannot blame the Faroese for adhering to the obvious view that they could secure a larger percentage of the catch in Faroese waters if fishing limits were extended.

The Minister explained the difference in the status of Iceland and the Faroe Islands from the point of view of international law, and refers in this connection to the agreement concluded by the Faroes with Great Britain in 1955, fixing the fishing limits at 3 miles except towards the west, where it extends somewhat farther. Considering how things have developed in the northern part of the Atlantic Ocean, it is no doubt generally admitted today that these fishing limits are obsolete and that a considerable extension must take place. The existing viewpoint that the special conditions prevailing in the North Atlantic (i.e., the presence of British, Scotch, Norwegian, German competitors) make it necessary to protect the interests of the Icelanders and Faroese, would also appear to be a natural one.

The Minister would like to see the whole problem of the North Atlantic solved by an international agreement. He feels it is likely that the discussions in the United Nations will result in setting up of a conference of experts to negotiate an international agreement.

The great problem today is the question of the extent to which overfishing is taking place. Prior to the War, this was apparently the case in the Faroes, but technical experts today are of the opinion that this reduction now only applies to certain minor categories of fish, among which is halibut. Today fishing in the Faroe Islands shows almost a maximum catch. Even if no overfishing takes place in the Faroes at the moment, this may prove to be the case during the next few years if fishing is allowed to expand. Limitation in the number of foreign vessels fishing in Faroe Island waters will increase the fish stock and the average size of the fish. It is important in this connection that the export of the fish from the Faroes consists principally of large fish. An increase in the fish stock would presumably also improve the possibilities for the traditional fishing done from open vessels. A reduction in trawling would constitute a great advantage to line fishing. . . .

In conclusion the Minister stressed the importance of carrying on biological research work in fisheries with Danish support as well as the importance of reorganizing the policing of fisheries in the Faroes and Greenland. Instead of naval vessels, which are now performing such services, the Minister would give preference to fast armed trawlers equipped with helicopters. It is not sufficient to desire an extension of the fishing limits, but the object must also be that of having it recognize internationally.

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FISHERY TRENDS, THIRD QUARTER 1958:

In the third quarter of 1958, the total catch landed at Danish ports was about 220,000 metric tons, 12 percent higher than the catch in the same quarter of 1957. Actually, the catch in July and August was less than for the same months of 1957. However, the September catch was estimated at 90,000 tons.

Despite the decrease in catch, exports for July and August showed gains over 1957. Including September estimates, 52,000 tons were exported, a gain of 31 percent over the 1957 quarter. Exports were valued at approximately 93 million kroner (US$13,465,000), 22.5 percent higher than in the 1957 quarter. In the earlier part of the third quarter 1958, exports of fish fillets, herring, fish meal, and solubles were relatively higher, whereas cod exports were lower.

Exporters of pond or rainbow trout are in difficulties, caused by Japanese competition. Although the export price of trout was lowered by about 4.3 U. S. cents a pound earlier in the summer, the export advantage afforded by the decrease was short-lived. In the middle of August the Danish trout growers learned that Japan had lowered its export price by about 6.6 U. S. cents a pound. This news had almost immediate consequences. Since the Danish production of pond trout in 1958 is reported to be the highest in history, the Association of Danish Trout Producers decided it was necessary to unload the excess on the domestic market. By early September it became possible to purchase fresh pond trout at retail prices only slightly higher than those prevailing for non-luxury fish.

The gradual conversion from small cutters to modern long-range cutters (some constructed of steel) is shown by the loan figures of the Fisheries Bank which were released at the end of September. In the course of the past year 51 loans were granted at an average amount of 108,600 kroner (US$15,723). In the previous year 64 loans were granted, averaging 71,600 kroner (US$10,366). While part of the increase may be due to increasing costs, the figures for new building loans indicate conversion to larger cutters. In 1957 the number of such loans fell from 50 to 43, but the total amount loaned increased from 3,580,300 kroner to 4,669,100 kroner (US$518,000 to US$676,000).

Ecuador

TUNA CANNERY OPERATIONS:

Located in the west central Ecuadoran seaport of Manta is a tuna cannery operated by a firm which is United States-owned and managed. This is the only company in Ecuador which packs canned tuna for domestic sale and export. Originally organized by an American citizen as a freezer-storage plant in 1951, in May 1956 it became a subsidiary company of a San Diego, Calif., fish cannery. It is now owned jointly by the American citizen and the company, the latter having a controlling interest.

Ecuador (Contd.):

The plant manager reports that production is not sufficient as yet to necessitate fully automatic devices. All spare parts and equipment acquired by the plant, as well as raw materials needed for the canning operation, including tin plate, soybean oil, and packaging labels, are imported from the United States. Because of the rough surf during three months of the year at Manta which makes anchoring for fishing vessels dangerous, the company maintains its own repair facilities at the small port of Bahia de Caraquez, about 30 miles north of Manta.

The company now has contracts with the owners of 20 vessels for the supply of fish to the plant. According to company officials, this number could be expanded to 30 in view of the current favorable season for tuna-fishing operations. Only two vessels of the present fleet possess freezing equipment. Since tuna vessels presently do not stay more than two days out of port, such equipment is not considered necessary. Six of the vessels are stated to have been constructed in the United States. At the time of this report only one vessel was of American registry. This vessel, a tender ship which carried fuel and possessed refrigerating equipment, was subsequently destroyed by fire while at sea on September 24, 1958. The company is reported to have contracted for another United States-registered tuna vessel from San Pedro, which is expected to enter the company's fleet shortly.

At present, tuna vessels contracted for by the company normally make only one-day trips out for fishing operations, returning to port nightly to unload their catches. No need has arisen to schedule fishing voyages of longer duration, in view of the current good volume of catches being registered within a short distance off shore. The principal type of tuna now caught is skipjack. Yellowfin is being caught in much less quantity, apparently due to bait conditions. Fishermen report that the yellowfin do not feed on the "colorada"-type bait generally caught locally.

Total production capacity of the plant is estimated at 300,000 cases yearly. Current production is averaging about 160,000 cases, of which 20,000 are for domestic sale and the remainder are prepared for export. All tuna is packed in imported soybean oil. Canned tuna for domestic sale is packed usually in 198-gram (7 oz.) cans, although the company has recently attempted to develop sales of a new 400-gram (14 oz.) can, containing salmon-type tuna in brine. Tuna in the smaller cans is of two types, grated and solid pack.

Tuna for export is packed in 4-pound cans and is shipped exclusively to the United States cannery. This tuna is utilized in the United States for the production of frozen tuna pies and for sale to restaurants.

Remnants from fish cleaning and canning operations are utilized for the production of fish meal. Output is on a relatively small scale. Meal is packed in large bags and sold locally in Ecuador to stockbreeders.

With the possible exception of Panama hats, the canned tuna exported by this company is unique in that it represents the only industrialized product exported at present from Ecuador. Until recently, the company's efforts to maintain adequate stocks of raw materials, including tin plate, oil, and labels, as well as spare parts and accessories for plant and fishing operations, had been hampered by complex import regulations involving advance approval by the Ecuadoran Central Bank for all such imports, as well as other regulations involving foreign exchange licensing permits. Apparently due to strong complaints by company officials, these regulations were considerably relaxed by a Government decree in mid-September.

The plant manager estimates that of the approximate 20,000 inhabitants of Manta, about 3,000 are now dependent for their livelihood upon the plant's operations. About 300 fishermen are employed in fishing operations. The total labor force at the plant averages about 175 people. Women are used exclusively in the cleaning and packing of fish. Average wages are about 15 sucres (US$1) daily for women and 18 sucres (US$1.20) for men.

Ecuador (Contd.):

The plant is currently producing at a level below its estimated total capacity. In view of both the present good tuna-fishing season and the steady rise in local consumption of canned tuna, the company is hopeful that domestic sales will increase to the point of assuming a greater share in total plant output. Factors which the company states should encourage this trend are: (1) the low retail prices for tuna packed for domestic sale--3 sucres (20 U. S. cents) for grated style and 6 sucres (40 U. S. cents) for solid packed; and (2) the development of better highway facilities, which enables the company's products to have easier access to inland cities. The company is also attempting to produce frozen shimp for export and canned sardines, though on a scale much lower than canned tuna. (United States Consulate dispatch from Guayaquil, October 28, 1958.)

German Federal Republic

TRAWLER CATCHES FULL LOAD OF OCEAN PERCH OFF LABRADOR:

The West German trawler Falkland in the fall of 1958 returned to Bremerhaven with a full load of ocean perch--4,700 boxes or 235 metric tons--taken about 120 nautical miles off the south coast of Labrador on Hamilton Bank. The trip took no longer than the usual trip to the Icelandic grounds, according to the report in Dansk Fiskeritidende (October 10, 1958), a Danish fishery trade journal.

Greece

TWO NEW FACTORYSHIP FREEZER TRAWLERS:

A Greek fishing firm has contracted for two new factoryship freezer trawlers from an Austrian shipyard. These new vessels will be added to the three presently being operated by the firm in Atlantic waters. The three vessels now fishing were purchased from a West German company.

The new factoryship trawlers are 219.8 feet in length, beam about 36.1 feet, moulded depth 27.9 feet, and the 1,580 h.p. engine will provide a speed of 14-15 knots. Freezing capacity will be about 18-20 metric tons in 24 hours and the fish hold capacity will be close to 500-550 metric tons of frozen fish. The new vessels will have over double the frozen fish storage space of the three factoryships now operating.

Iceland

FAILS TO GET UNITED NATIONS TO ADOPT INTERNATIONAL FISHING LIMITS REGULATIONS:

Iceland's efforts to have the United Nations General Assembly adopt international regulations on fishing limits have been unsuccessful, the Icelandic Foreign Minister announced in a radio address on the eve of United Nations Day (October 24, 1958). He advised that it was now safe to assume that a second Law of the Sea Conference will be held. The Foreign Minister said: "The Icelandic delegation at the U. N. General Assembly has protested the plan to hold a new conference. The delegation maintains that the United Nations Organization must itself find an international solution of the problem which establishes the reasonable rights of coastal states and takes fully into consideration the special position of those states which depend chiefly upon fisheries (off their own coasts) for their existence, such as Iceland."

On his attendance at the U. N. General Assembly, the Foreign Minister reported in part: "Advantage was also taken of the opportunity--in a speech--to charge the British with aggression against the Icelanders. A formal charge was not made, as such action would have resulted in separate discussions of Iceland's territorial waters issue, and the matter would have been referred to the Security Council, in which Britain is represented and enjoys veto power. I shall make no prediction as to what will develop at the prospective conference. ..."

Iceland (Contd.):

The Icelandic President took up the same theme in his United Nations Day address October 24, and said that the United Nations is now far advanced in preparing a second Law of the Sea Conference. Had it not been for international cooperation, said the President, Icelandic fishery affairs would not have made as much progress as has been achieved.

The United Nations General Assembly agenda contains the question of whether or not to convene a second conference on the Law of the Sea under United Nations guidance. Iceland's claim to 12-mile fishing limits is not on the agenda.

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MIGHT ACCEPT INTERNATIONAL COURT JURISDICTION IN FISHING LIMITS DISPUTE:

Reviewing the fishing limits issue before the Reykjavik Social Democratic Society on November 4, 1958, the Icelandic Foreign Minister intimated that Iceland might be willing to have the dispute taken before the International Court of Justice. Recalling that the British Foreign Minister had proposed this, in a speech before the United Nations General Assembly, the Icelandic Foreign Minister suggested two ways in which this could be done: (1) the British could charge Iceland with a violation of international law, or (2) the British could invite the Icelanders to agree to submit the matter to the International Court of Justice.

The Icelandic Coast Guard Service issued a press release on November 1 stating that a total of 113 British trawlers had been charged (some more than once) with illegal operations within the new fishing limits of 12 miles (unilaterally announced by Iceland).

According to Morgunbladid (November 4, 1958), the Consultative Assembly of the Council of Europe, during its recent meeting in Strassburg (October 10-18), discussed Iceland's fishing limits issue in the general political debate.

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FALL HERRING CATCH POOR THROUGH OCTOBER 30, 1958:

As of October 30, 1958, Icelandic driftnet catches for the autumn herring were light. The prospects are that this secondary herring season off Iceland's Southwest coast and in Faxa Bay will turn out to be as great a failure as in 1957. Therefore, Iceland will not be able to meet the advance sales commitments. Contracts have been made for 85,000 barrels (50,000 to Russia, 20,000 to Poland, and 15,000 to East Germany), but only 35,000 have been caught. Towards the end of October, however, the herring again appeared off the Reykjanes peninsula, and the Icelandic Herring Board was hopeful that the contracts could be fulfilled.

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FREEZING PLANTS PROSPEROUS IN 1958:

Iceland's production of frozen fillets had reached 62,310 metric tons by October 15, 1958, or more than the entire 12-months production in 1957. The trawlers are still coming back from Labrador with holds and decks filled with ocean perch.

The Icelandic Freezing Plants Corporation, whose associated companies produce some 85 percent of frozen fish exports, had turned out some 30 percent more frozen cod and about 50 percent more ocean perch fillets than during the same $10\frac{1}{2}$ months in 1957.

The General Manager of the Corporation pointed out the improved market in the United States, which had already taken 14,000 tons with deliveries still going strong, compared to some 11,000 tons for all of 1957.

Iran

FISHERY TRENDS, NOVEMBER 1958:

The Iranian fish cannery at Bandar Abbas on the Persian Gulf is proceeding with the installation of US$60,000 worth of new cannery machinery provided by the United States Overseas Mission to Iran. The fish cannery manager stated

Iran (Contd.):

that the cannery probably would not be ready until the spring fishing season of 1959.

The cannery manager also expressed some concern about the future of shrimp resources in the Persian Gulf, which are being exploited by the Japanese. He believes that a study of the migration patterns and spawning habits is urgently needed to avoid depletion of the shrimp resources.

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SHRIMP FISHERY TO EXPAND:

Two shrimp fishing vessels are operating in the Gulf of Oman and the Persian Gulf for a Swiss-registered fishing company of Bandar Abbas, Iran. According to reports from British fishermen, who had been working on the company's shrimp vessels on a six-months contract, the company plans to send 20 more vessels and a mothership to those areas to process and store the catch.

The British fishermen reported that record catches of about 6 tons daily were made, as compared with maximums of 4-5 tons daily in other parts of the world.

Another indication that shrimp are abundant in the Persian Gulf and the Gulf of Oman is the retail price of 10 U. S. cents a pound (probably heads on) in the bazaar at Bandar Abbas (United States Consul at Istahan, November 8, 1958).

Japan

CANNED SQUID PACK LOWER FOR 1958 SEASON:

The Japanese peak squid fishing season (July and August) yielded a catch only about 30 percent of normal in 1958. Usually Japan exports about 80,000 cases of canned squid annually, chiefly to the Philippines and Singapore. The poor catch has resulted in a tripling of ex-vessel prices and up to the first part of October only 10,000 cases had been packed.

Prior to the start of the squid fishing season in 1958, new Japanese trading companies had taken orders for canned squid at US$2.90 a case, or about 40-50 cents a case lower than the 1957 price. The low selling price, coupled with the poor catches and high ex-vessel prices, has created a severe shortage, estimated to be about 30,000 to 40,000 cases. (Suisan Tsushin, September 8, 1958.)

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EXPORTS OF SELECTED FISHERY PRODUCTS TO THE UNITED STATES, JANUARY-JUNE 1958:

During the first six months of 1958, Japanese exports of 28,708 metric tons of frozen tuna to the United States were valued at US$8,348,000, an increase of 18.3 percent in quantity and 16.8 percent in value, as compared with the same period in 1957. Canned tuna exports (8,719 tons) to the United States January-June 1958 were valued at US$7,118,000, an increase of 35.2 percent in quantity and 18.7 percent in value over the first six months of 1957. Exports of other canned fish (mostly salmon and oysters) and of fish and whale oils were also up sharply from the same period in 1957.

Japan's Exports of Selected Fishery Products to the United States, January-June 1958

Item	Quantity		Value	
	Jan.-June		Jan.-June	
	1958	1957	1958	1957
	(Metric Tons)		(US$1,000)	
Tuna, frozen	28,708	24,266	8,348	7,148
Tuna, canned	8,719	6,449	7,118	5,996
Crab meat, canned	1,293	1,458	2,928	3,543
Other canned	9,837	4,853	8,042	4,862
Fish and marine animal oils	9,068	1,124	3,248	1,903

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FISHERMEN'S EARNINGS NORTH PACIFIC MOTHERSHIP SALMON OPERATIONS:

The over-all gross earnings per catcher boat engaged in Japanese North Pacific mothership salmon operations for the 1958 season amounted to ¥16.5 million (US$45,833). This is a sharp drop from the average of ¥23 million (US$63,710) earned for the 1957 season, according to an article ("A General Accounting of the Northern Salmon Fishing") in Suisankai, journal of the Fisheries Society of Japan.

For the fleets operating east of Kamchatka the average gross earnings per catcher boat ranged from a high of ¥19 million (US$52,630) for the Shinano Maru fleet to a low of ¥14.5 million (US$40,165)

Japan (Contd.):

for the Shoei Maru fleet. The Tenyo Maru fleet, which fished west of Kamchatka, had a lower average--¥12.7 million (US$35,179).

The salmon gill-net catcher boats accompanying the motherships range in gross tonnage from 50-85 tons (the present maximum legal limit for vessels of this type), with an average of about 60 tons. These vessels carry crews of 18-22 men.

The share system on these salmon catcher boats differ somewhat from one part of the country to another. On boats from Chiba Prefecture, for example, each man gets a guarantee of about ¥10,000 (US$28) a month, plus a share in 20 percent of the boat's earnings. The fishing captain gets1.8 shares, the chief engineer 1.7, the paper captain and the radioman 1.5, the deck engineer and bosun 1.3, and ordinary fishermen 1.0 share.

Miyagi Prefecture boats: the crew's guaranteed salary is about ¥13,000 (about US$36) a month, and they share 10 percent of the boat's earnings up to ¥10 million (US$27,708), 13 percent of the next ¥5 million (US$13,850), 15 percent of the next ¥5 million, and 17 percent of earnings above ¥20 million (US$55,500).

According to estimates published in the Shukan Asahi of July 13, 1958, if the boat grossed ¥15 million (about US$41,550), an ordinary Chiba Prefecture fisherman would take home about ¥170,000 (US$470) and a Miyagi Prefecture fisherman about ¥130,000 (US$360) for his 4 months' work. This is considered very good pay, and the mothership-type salmon fishing is the most remunerative part of the year's work for the fishermen fortunate enough to participate in it, the United States Embassy in Tokyo reported in a dispatch dated October 20, 1958.

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FISHERY IMPLICATIONS OF CHINESE 12-MILE TERRITORIAL WATERS ZONE CONSIDERED:

The Fisheries Society of Japan called an "Emergency International Fisheries Committee" meeting on September 6, 1958, to consider the fishery implications of Communist China's recent declaration of a 12-mile zone for territorial waters. The meeting decided that it would not be proper for the fishing industry to issue a statement on the matter, as the Government had already made Japan's position (inability to accept the declaration) clear. The committee further resolved to support a speedy solution of the territorial waters problem by the United Nations.

Meanwhile, press reports from Nagasaki, an important base for trawlers which fish off the Chinese coast, were that industry circles there expected no important effect on their operations from the Chinese declaration. They have been scrupulously observing the closed zones established under the unofficial Sino-Japanese fisheries agreement, even though the agreement itself lapsed June 12, 1958, and under that arrangement they stay from 12 to 60 miles off the coast. (Suisan Keizai Shimbun, September 7, 1958.)

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FROZEN TUNA PRICE TRENDS:

Early in September 1958, the Japanese press reported that the price of frozen yellowfin tuna, which had been rising since spring, had turned down from its mid-August peak of US$300 f.o.b. Japan per ton for 20-80 pound "clipper" (ship-frozen) fish. By the end of August the price was down to the April-May level of $270 for "clipper" fish and $260 for Iceboat fish, and showed signs of softening further. The rise was explained in Japan by the good market for canned tuna in the United States this past summer and the short Japanese summer albacore catch. The drop was due to the fact that the big United States packers had bought all of their requirements and the California sardine catch was so good that it diverted packing effort to sardines.

Frozen skipjack tuna prices also reached a peak in mid-August 1958 at $215 for 15-pound fish, but fell suddenly late in the month, and at the beginning of September were $180 for 7-10 pound, $190 for 10-15 pound, and $200 for fish over 150 pounds. The mid-August price was considered quite good, in view of ex-vessel prices at that time of $147-$171 for

Japan (Contd.):

large skipjack from the Bonins area. Although exports of frozen skipjack to the United States were only 21 tons last year and 73 tons in the year before, it was estimated that about 2,000 tons had been sold to United States canners up to the first of September 1958 (Suisan Tsushin, September 1 and 2, 1958).

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PLANS FOR MOTHERSHIP-TYPE TRAWLER FLEET FISHING IN NORTH PACIFIC:

With the end of the salmon mothership operating season, Japan had completed plans for 1958 mothership-type trawler fleet fishing in the North Pacific. Plans called for four fishing fleets. Two (the Chiyo Maru and Miyajima Maru) in the Bering Sea and two (the Tenyo Maru and the Itsukushima Maru) in the Sea of Okhotsk. Last year six fleets took part in the fishery, four of them in the Bering Sea. Expected production of about 20,000 metric tons will be about one-third less than in 1957.

The cutback in effort in this fishery is blamed on a weak domestic market for frozen flatfish. Last season the operators started out selling their catch at 4-4½ cents a pound (with the break-even point at about 5 cents), and after the end of the year the price fell drastically, until in February and March the companies had to dispose of their large holdings at around 2 cents a pound.

All four fleets sailed for the grounds between August 25 and 27, 1958, with the end of fishing scheduled for the latter part of October. The two motherships in the Bering Sea will employ four or five 600-ton otter trawlers each, while the Okhotsk fleets will use 8 to 10 small (75-80 ton) trawlers. Planned production totals 18,800 metric tons of frozen flatfish and 1,210 tons of salted cod. (Suisan Tsushin, September 4, 1958, Suisan Shuho, August 25, 1958.)

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SEED OYSTER EXPORTERS REACH AGREEMENT ON EXPORTS:

An agreement among the three largest exporters of Miyagi Prefecture seed oysters to the United States was approved in August 1958 by the Japanese Ministry of International Trade. Under the previous agreement, 59,943 cases were exported at the highest prices in history. This year the exports will be limited to 55,000-60,000 cases at US$7.00 a case for cut cultch and US$6.50 for the uncut, f.o.b. Shiogama. The agreement was reached in order to prevent excessive price competition among the exporters. (Suisan Tsushin, August, 29, 1958.)

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STUDY EFFECT OF END OF BRITISH CANNED SALMON IMPORT CONTROLS:

Japanese salmon producers and exporters have been busy trying to predict the effects on their business of the end of British canned salmon import controls. As of September 24, 1958, the British removed all quantity restrictions on canned salmon imports from areas other than the Soviet Bloc. Although the Japanese believe the change was made to placate Canada, which had a record pack of red salmon in 1958, it could result in an increase in Japanese sales of canned salmon to the British market. The British announcement was completely unexpected, even by the London offices of Japanese trading firms, and the Japanese exporters appear to feel that they must rush planning of new sales policies if they are to take full advantage of the new situation.

Prior to World War II the United Kingdom received about 2 million cases of Japanese canned salmon annually, but under the present trade agreement between the two countries, with salmon in the specific license category, imports have been held to less than 1 million cases. This leads the Japanese to think that a broad increase in exports to Britain is possible; however, they foresee that this means a shift of emphasis from the United States to the British market, with a sharpening of competition with United States and Canadian producers. The anticipated surge toward the newly-expanded British market may also bring about increased competition among Japanese traders, and a strengthening of the

Japan (Contd.):

controls exercised by the Canned Salmon Joint Sales Company is thought to be desirable (Suisan Tsushin, September 19 and 20, 1958.)

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THIRD TUNA MOTHERSHIP FISHING FLEET SAILS FOR TROPICAL PACIFIC GROUNDS:

The third Japanese tuna mothership fleet of 1958 sailed for the tropical Pacific, replacing another fishing company's No. 2 Tenyo Maru in the area south of Fiji. On August 25, the fishing company operating the third fleet ordered its 7,600-ton Koyo Maru (which had returned only 4 days earlier from Bering Sea salmon operations) to sail from Tokyo for the Fiji area. The mothership was scheduled to begin taking fish aboard on September 8, 1958, and to continue operations until about November 5, with a production goal of 6,325 short tons.

The sending of this mothership to this area, where good albacore catches have been reported lately, probably reflects the poor summer albacore catch this year, and the consequent shortage of frozen albacore for export to United States packers. (Suisan Keizai Shimbun, August 25, 1958.)

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TRANSSHIPMENTS OF ATLANTIC TUNA TO UNITED STATES:

During the summer of 1958, arrangements for transshiping tuna caught by Japanese vessels in the Atlantic Ocean to the United States through various South American and Caribbean ports have been attracting attention. Three schemes have already been approved, and another Japanese trading firm reportedly has applied for approval. The three transshipment schemes presently in operations are: One Japanese fishing company is using three vessels (the Kinryu Maru, Kairyu Maru, and No. 2 Banshu Maru) to deliver a total of 2,300 tons of tuna to the Puerto Rico tuna cannery via Haiti--2,100 tons of yellowfin at US$245 c. & f. and 200 tons of albacore at US$345 c. & f. Another company, using its No. 30 Hoko Maru, is selling 450 tons of yellowfin tuna, through a trading firm, to a United States West Coast canner. The transshipment point is Cristobal, Panama, and the prices for the 50 tons of round fish are US$275 for 20-80 pound fish and US$265 for 80-100 pound fish; for the 400 tons of fillets the price is US$280 a ton. A third company, using the No. 15 Kaiko Maru, is selling 500 tons of yellowfin tuna fillets to eastern United States packers via the British Island of Trinidad at a price of US$265 a ton.

The Japanese Fishery Agency has consulted with the Foreign Office and the Ministry of International Trade and Industry on the matter of direct delivery of tuna abroad by Japanese fishing boats for export to the United States. Because it appeared that the regulations in force might operate, under the present circumstances, to obstruct the development of the tuna fishing industry, the following new policies have been worked out: Permission to land fish abroad will be granted separately for each trip, after consultation with the two ministries (however, this does not apply to landings at American Samoa and New Hebrides); permission will not be granted where it appears that it would impede development of the Japanese tuna fishing industry and export trade; no landings abroad will be permitted which are not in accord with export regulations applied within Japan; permission will be granted only where the price appears to be in balance with the prices for which tuna is exported from Japan; in the case of vessels fishing in the Atlantic, permission will be limited to vessels which, before sailing from Japan, had been granted permission to deliver fish abroad for export elsewhere than to the United States; transfer of the catch from one vessel to another will not be permitted. These policies are in effect as of September 2, 1958. (Suisan Tsushin, September 8, 1958.)

Libya

ADHERES TO LAW OF THE SEA RESOLUTIONS:

The Libyan Council of Ministers approved the adoption of the resolutions passed by the delegates to the United Nations Conference on the Law of the Sea, held in Geneva during February and March 1958. The Libyan Council also instructed the Ministry of Communications to implement its decision extending Libya's territorial waters to 12 miles, the United States Embassy in Tripoli reported on November 10, 1958.

Mexico

SHRIMP BREADING PLANT PLANNED:

The shrimp freezing plant at Coatzacoalcos, Veracruz, on the Gulf of Mexico, plan to produce breaded shrimp for the United States market. This plant will also produce individually-frozen shrimp for export. Since this is a new venture for Mexico, productive capacity is not yet known. When the plant comes into full production it will have two United States-manufactured peeling and deveining machines--one for individually-frozen shrimp and one for breaded butterfly shrimp. (November 6, 1958, dispatch from the U. S. Embassy in Mexico.)

Morocco

CANNED SARDINES SURPLUS:

The Moroccan sardine season ended in October 1958. Another large surplus of canned sardines is expected, for which markets are far from assured. Exports in 1958 to France (the principal market for Moroccan sardines) were less than 60 percent of 1957 shipments, according to figures available by October 1958. Also, prices for 1958 are about 20 percent lower than in 1957. From that month, only five months remained to sell what was left of the 1958 French quota for Moroccan sardines, which may enter France under favorable customs treatment. But sales were poor.

FISHERY TRENDS:

The chief problem of Morocco's commercial fishing industry (mainly canned sardines and tuna) remains that of finding foreign markets. With a heavy backlog of canned fish from 1957, 80 percent of the fishermen were not fishing and most of the canneries were shut down in October 1958.

Lack of markets is becoming a chronic problem. Some attempts are being made to reverse this trend. One company now produces a metric ton a day of fish meal processed for human consumption, and hopes to market the high-protein product in Africa and Asia as well as locally.

According to a Moroccan exporter, exports of fresh and frozen fish are far less than last year. Italy, for example, received 120 metric tons, only one-fifth of the 1957 exports of fishery products to that country.

Nicaragua

SHRIMP FISHERY TRENDS:

Early in November 1958, 40 shrimp vessels were fishing off the Caribbean coast of Nicaragua. In July 1958, about 55,600 pounds of shrimp (export value US$24,370) and in August 37,400 pounds (export value US$15,149) were landed by the vessels.

All fish exploration licenses were due to be cancelled on December 31, 1958, but firms or individuals planning to operate after that date were eligible to apply for permanent licenses. Two of the active fishing companies, one of which is establishing a fish meal plant at Bluefields, have already applied for permanant licenses, the United States Embassy at Managua reported on November 6, 1958.

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Norway

COMMITTEE RECOMMENDS CHANGES IN FISHING INDUSTRY:

The report by a committee on the Norwegian fisheries (set up by the Norwegian Government in 1957) was released to the press on November 10, 1958. The committee, established to study the cod-fishing sector in particular, has conducted a thorough investigation of the entire fishing industry to find means of increasing the profitability of the fisheries. Its chairman is the Director of the Bank of Norway and at one time was Minister of Finance and of Commerce. The views and findings of the Committee will serve as the basis for determining future Norwegian fishing policies.

Among the far-reaching and forward-looking recommendations in the report, according to press accounts, are the following: (1) The industry should engage in more year-round deep-sea fishing and build up a fleet of large ocean-going trawlers. (2) Increased efforts should be made to sell more quality fish products such as salted fish and frozen fish fillets to the high-price markets; less stockfish and klipfish should be produced. (3) The Government should establish a condemnation fund for the replacement or scrapping of inadequate vessels. (4) The state should set up a special fund for conducting experiments with new fishing gear and methods. (5) Certain tax concessions should be granted. The Committee also recommended the development of new industries in the coastal districts to draw labor away from unprofitable fishing enterprises.

The report will first be distributed to the various fisheries organizations. It will next be studied by the Ministry of Fisheries in the light of views of the fisheries organizations and then will be submitted to the Storting for consideration and possible action.

It is expected that there will be considerable opposition from the fishermen to many of the Committee's proposals. Norwegian fishermen, who have traditionally preferred one-man or family enterprises, and who in many instances engage in part-time farming, will be reluctant to give up their freedom of operation to become employees of trawling companies. The prospect of increased income, however, from employment by such companies would serve as a considerable inducement.

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HERRING SALE TO RUSSIA:

With the sale of 2,500 metric tons (25,000 barrels) of Norwegian-caught Iceland herring to Russia, all of the 1958 catch has been sold. The herring were shipped in November 1958 and the price to the Russians was the same as a year earlier. The sale of the Iceland herring was made under the three-year trade agreement which expires December 31, 1958, the United States Embassy in Oslo reported in a November 14, 1958, dispatch.

Philippines

SECOND FLOATING FISH CANNERY RECEIVED FROM JAPANESE:

A 2,000-gross-ton floating fish cannery was due to be delivered to the Philipine Government on November 19, 1958, under the Japanese reparations program. The M/S Estancia, with a canning capacity of 840 cases of half-pound cans per day, is the second floating fish cannery to be delivered to the Philippines. The first cannery, the M/S Magsaysay, was delivered to the Philippine Government on September 20, 1958.

Portugal

CANNED FISH EXPORTS, JANUARY-AUGUST 1958:

Portugal's exports of canned fish during January-August 1958, amounted to 38,267 metric tons (2,383,100 cases), val-

Portuguese Canned Fish Exports, January-August 1958

Species	Metric Tons	US$ 1,000
Sardines in olive oil	25,847	13,713
Sardinelike fish in olive oil	4,054	2,768
Sardine & sardinelike fish in brine	670	151
Tuna & tunalike fish in olive oil	1,364	1,092
Tuna & tunalike fish in brine	514	313
Mackerel in olive oil	4,929	2,169
Other fish	789	239
Total	38,267	20,445

Portugal (Contd.):

ued at US$20.4 million, as compared with 30,886 tons, valued at US$19.1 million, for the same period in 1957. Sardines in olive oil exported during the first eight months of 1958 amounted to 25,847 tons, valued at US$13.7 million.

During January-August 1958, the leading canned fish buyer was Italy with 7,191 tons (valued at US$3.7 million), followed by Germany with 5,982 tons (valued at US$3.2 million), Great Britain with 3,882 tons (valued at US$2.0 million), the United States with 3,708 tons (valued at US$2.7 million), and Belgium-Luxembourg with 2,680 tons (valued at US$1.4 million). Exports to the United States included 1,747 tons of anchovies. (Conservas de Peixe, October 1958.)

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CANNED FISH PACK, JANUARY JUNE 1958:

The total pack of canned fish for January-June 1958 amounted to 12,619 metric tons as compared with 15,508 tons for the same period in 1957. Canned sardines in oil (6,818 tons) accounted for 54.0 percent of the January-June 1958 total pack, higher by 4.2 percent than the pack of 6,545 tons for the same period of 1957, the October Conservas de Peixe reports.

Portuguese Canned Fish Pack, January-June 1958

Product	Net Weight	Canners' Value
	Metric Tons	US$ 1,000
In Olive Oil:		
Sardines	6,818	3,688
Sardinelike fish	991	490
Anchovy fillets	1,748	1,502
Tuna	1,357	1,003
Other species (incl. shellfish)	239	165
In Brine:		
Sardinelike fish	1,117	190
Other species	349	123
Total	12,619	7,161

Note: Values converted at rate of 28.75 escudos equals US$1.

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FISHERIES TRENDS, AUGUST 1958:

Sardine Fishing: During August 1958, the Portuguese fishing fleet landed 15,086 metric tons of sardines (valued at US$1,658,260 ex-vessel or $110 a ton). In August 1957, a total of 10,634 tons of sardines were landed (valued at US$1,506,608).

Canneries purchased 63.6 percent or 9,591 tons of the sardines (valued at US$1,116,000 ex-vessel or $116.36 a ton) during August. Only 9 tons were salted, and the balance of 5,486 tons was purchased for the fresh fish market.

Matosinhos lead all other ports in August landings of sardines with 8,980 tons or 59.5 percent, followed by Portimao 2,102 tons (13.9 percent), and Setubal 1,069 tons (7.1 percent).

Other Fishing: The August 1958 landings of fish other than sardines were principally 4,763 tons (value US$277,565) of chinchards, 4,028 tons (value US$340,556) of anchovies, 1,842 tons of mackerel (value US$131,200), 538 tons of tuna (value US$130,052), and 54 tons of bonito (value US$8,104), (Conservas de Peixe, October 1958).

Rhodesia

FRESH FISH SHIPPED BY RAIL FROM CAPE TOWN:

Fresh fish can now be distributed to retailers in Southern Rhodesia daily, instead of only twice weekly, with the open- of a £70,000 (US$196,000) cold-storage plant in Salisbury.

Supplies to the new plant will be maintained by regular "fresh fish trains" from Cape Town, South Africa, twice each week. The first of these arrived shortly before the official opening of the plant. The fish, straight from the trawlers, were packed in crushed ice, and the temperature had risen only 7 degrees during the journey.

Special refrigerated trucks carrying frozen fish and other food products come to the plant with products from the United Kingdom, Canada, Denmark, and Holland.

Six freezers capable of holding 236 tons and an ice room of 45 tons capacity ensure that the fish is kept in good condition for distribution later. (The Fishery News, November 7, 1958.)

Singapore

PLANS FOR TUNA CANNERY AND FREEZING PLANT NEAR COMPLETION:

Plans for the tuna cannery and freezing plant to be built jointly with Singapore and Japanese capital are now near realization. A Japanese fisheries mission was in Singapore in November 1958 studying the plans and conferring with Government officials. The manager of the Singapore Industrial Promotion Board in a public statement said that an agreement on establishing a tuna fishing industry in Singapore is expected by the end of 1958.

Plans call for the investment of M$5,000,000 (US$1,633,000), with the Japanese providing 51 percent and local sources the remainder. It is expected that 250 people will be initially employed at the plant, the United States Consul at Singapore reports in a November 14, 1958, dispatch.

Note: Also see Commercial Fisheries Review, March 1958 p 54.

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Sweden

DELEGATES REPORT ON INTERNATIONAL FISHING CONFERENCE HELD IN PARIS:

The delegates representing the Swedish Fishermen's National Association at the October 1958 International European Fishing Conference held in Paris on fishery questions, reported that because of recent incidents in Icelandic waters, it was natural that the question about fishing boundaries attracted great interest at the conference.

The two delegates stated in a press interview that in many countries there is great uneasiness as to the future with respect to this matter of territorial waters. In order to prevent, if possible, further "desperate boundary extensions" the conference adopted a resolution urging all governments in the countries concerned to make a real effort to convene an international conference as soon as possible to solve this question. The resolution also appealed to the governments not to make any changes whatever until the international conference concluded its work, the main purpose of which would be to assure that fishing rights with historic traditions are respected.

The Paris conference also discussed certain proposals presented by the International Labor Organization on minimum age of employment in the fishing trade, certain health questions, and other matters. The European common market was another subject for discussion, evidently rather a delicate one. The leading fishery nations apparently differed widely in their opinions.

At the Paris conference the text of the bylaws of a new organization was finally agreed upon, and many of the delegates were prepared to join the new organization, the name of which would be the Western European Fishery Conference.

The countries represented at the conference were Sweden, Great Britain, France, Holland, Belgium, West Germany, Spain, Portugal, Norway, and Denmark. (Report from the United States Consulate at Goteborg, November 10, 1958.)

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PROPOSED SCANDINAVIAN COMMON MARKET CAUSE OF CONCERN TO FISHERMEN:

In replying to a formal question by the spokesman for the fishermen's organizations in the Swedish parliament, the Minister of Commerce stated that the fishermen's organizations will be given an opportunity to make a statement regarding the supplemental report of the Scandinavian Economic Cooperation Committee on the Scandinavian common market. The Minister also said that "no decision as to a Scandinavian common market is expected to be reached at the session of the Nordic Council now meeting in Oslo, but perhaps the Council will be called to an extra session next year for final discussion of the question." A common market as to fishery products could probably not be carried through as an isolated event, the Minister said, but only as a link in a Scandinavian common market for all or practically all branches of trade.

Swedish fishermen, according to a statement made by their spokesman in Parliament, are very uneasy about Scandinavian cooperation. Fish imports into Sweden, he said, have increased heavily during the last few years while it has become increasingly difficult to sell Swedish fish in the international market.

Agriculture and fishery, he stated, are working under similar conditions. It would therefore be desirable, he argued, that their products be treated in an identical manner and occupy the same position in Scandinavian common trade. He also stressed the fact that the fishermen's organizations as well as private individuals have invested large sums of money in machines for fish fillets for the Swedish market. For this reason, he maintained, imports from Norway and partly also from Denmark, constitute a problem. Furthermore, he said, Swedish fishing grounds are far off in the North Sea while the Norwegians have theirs close by, and therefore competition does not take place under identical conditions. For these reasons, he appealed to the Minister of Commerce to accord identical treatment to fishery products and agricultural products at the Scandinavian negotiations, the

Sweden (Contd.):

United States consul in Goteborg reported on November 12, 1958.

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SUMMER HERRING CATCH LOWER:

The landings of herring by Swedish trawlers from July 1-September 30, 1958, totaled 12,400 metric tons as compared with 25,900 tons in the same period of 1957. The quantity of herring salted at sea declined from 4,600 tons to 3,200 tons, and herring salted ashore from 5,100 tons to 1,600 metric tons during this three months period.

Due to the reduced herring catch, Swedish west coast fishermen are facing difficulties in fulfilling the export agreement for 1958 with East Germany.

The Fladen herring fishing season was ended and West Coast fishermen hoped that the winter herring fishing would give a better yield, the United States Consulate at Goteborg reported on November 10, 1958.

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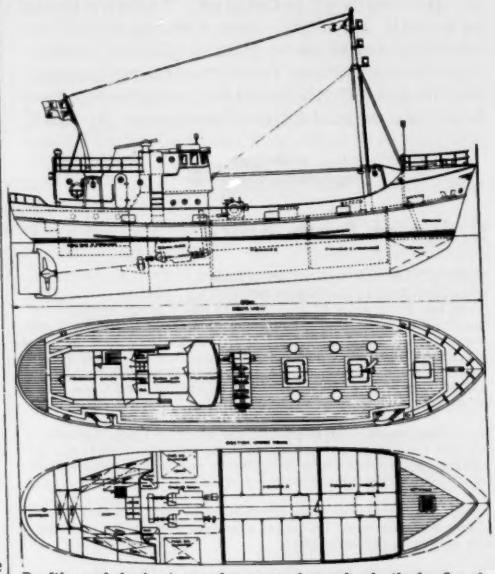
TWO STEEL TRAWLERS CONTRACTED FOR IN HOLLAND:

The keel of a new steel trawler ordered by Swedish fishermen was recently laid at a Dutch shipyard in Zaandam and will be delivered in March 1959. The trawler has an over-all length of 23.7 meters (77.7 feet), a breadth of 5.80 meters (19.0 feet), and a molded depth amidship of 2.85 meters (9.3 feet).

The trawler is being built in conformity with the highest class of the Norwegian classification society (Norske Veritas), with ice strengthening in the forepart of the hull and with 12 millimeter (about $\frac{1}{2}$ inch) steel plate in the bow. The machinery will consist of two twin 8-cylinder Diesel engines of 400 horsepower coupled to a single shaft. Since the trawler will be fishing in distant waters provision is made for a large supply of fresh water and fuel oil.

The hull will be divided into four watertight bulkheads. One section will contain space for gear and fuel tank, two sections for fish holds (one of which is insulated), one section for engineroom, and one section for stern cabin.



Profile and deck views of new steel trawler built for Swedish fisheries.

Another steel trawler for Swedish account is being built in Holland. The order for this trawler was placed at a Dutch shipyard in Amsterdam. The trawler was launched during the middle of November 1958.

This trawler, somewhat larger than the trawler under construction at the Zaandam yard, has a length of 26.4 meters (86.6 feet), a breadth of 6.2 meters (20.3 feet), a depth of 3.1 meters (10.2 feet), and a gross tonnage of about 100 tons.

This trawler, powered by a 460-horsepower Diesel engine, has a maximum speed of 13 knots. All types of modern equipment, such as radiotelephone, echo-sounding device, and a direction finder were installed.

The Swedish contractor plans to sell this trawler to a fishing team on the Swedish west coast and hopes that this type of trawler may serve as a prototype for other trawlers which could be built at Swedish yards.

Sweden (Contd.):

Indications are that the trend towards larger boats will continue. The new boats are built for high-seas fishing which for various reasons is taking place farther and farther away from the home ports, reports the United States Consul in Goteborg in a report dated November 18, 1958.

Union of South Africa

SOUTH AND SOUTH-WEST AFRICA PILCHARD-MAASBANKER INDUSTRY, 1958:

In the first week of August 1958 the fishing industry of the Union of South Africa Cape west coast passed the 250,000-metric-ton annual quota for pilchard and maasbanker (jack mackerel) for the first time since this limit was imposed in 1953. With some good fishing periods during the month of August, landings were expected to bring the total Cape catch to just under the 300,000-ton mark for the season.

As the result of an arrangement made in 1955, the industry was permitted to continue fishing through August but all catching stopped at the end of August and factories and boats now have a four-month lay-up period.

Several factories have already been stripped down, and plants will undergo a thorough overhaul before the next season starts in January 1959.

In South-West Africa Walvis Bay the 1958 season was also drawing to its close as the catch approached the 250,000-ton limit. Each of the six Walvis Bay factories, however, has its own quota and so there is no sudden end to fishing as in the Union.

Although the year still has more than three months to go, the 1958 season is already certain to be one of the best ever for most sections of the industry. Fish products are moving steadily into local markets and exports have been at a high level through most of the first nine months of the year.

Between May and September, the South African Fish Meal Producers' Association chartered five vessels to carry South and South-West African meal to the United Kingdom and the European Continent. Other vessels were chartered to take bulk exports of fish-body oil.

According to figures released by the Division of Fisheries, the Union of South Africa Cape west coast catch in July was 25,613 tons pilchards, 1,109 tons maasbanker, and 1,151 tons mackerel. The month's total catch of 27,873 tons brought the total for the first seven months of the year to 271,323 tons, comprising 187,823 tons pilchards, 61,394 tons maasbanker, and 22,106 tons mackerel. The quota fish (pilchards and maasbanker) total January-July was 249,217 tons.

The July 1958 catches compare with 1,911 tons pilchards and 403 tons maasbanker in July 1957. The July 1958 catch yielded 5,408 tons fish meal, 113,441 gallons fish oil, 626,253 pounds of canned pilchards, 506,208 pounds of canned maasbanker, and 356,028 pounds of canned mackerel.

The pilchard catch at Walvis Bay January-July totaled 182,369 tons. (The South African Shipping News and Fishing Industry Review, September 1958.)

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SPINY LOBSTER MEAT USED TO MAKE CRACKERS:

Attractive crackers prepared from shrimp and tapioca flour, imported into South Africa caused the Fishing Industry Research Institute, Cape Town, to investigate the use of spiny lobster meat in crackers.

While the shrimp crackers when immersed briefly in hot oil before serving expand and take on a light, foamy, but crisp texture, this was not easily obtained when similar crackers were prepared from lobster meat. The Institute then experimented with tapioca dough and found that crackers made from a finer flour with a higher moisture content (8.9 percent) gave, when cooked, better expansion with larger bubbles than those with a lower moisture content made from coarser flour. (Australian Fisheries Newsletter, October 1958.)

U. S. S. R.

BRITISH FROZEN COD FILLETS SALE TO RUSSIA INCREASED:

The 4,000-ton contract for frozen cod and coalfish or coley fillets between the Soviet Union and United Kingdom processors, for delivery by Britain between March and September 1958, was increased to 6,050 tons.

Hull will supply about 57 percent, Grimsby 35 percent, and Fleetwood 8 percent of the total--(Australian) Fisheries Newsletter, October 1958).

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EXPANSION OF ANTARCTIC WHALING FLEET:

The first of three new whaling factoryships has been launched by the Russians and will participate in the 1959/60 Antarctic season. The new factoryship expedition, named Sovjetskaja Ukraina, will consist of the factoryship and 20 modern fast whale catchers according to the October 1958 Norsk Hvalfangst-Tidende (The Norwegian Whaling Gazette).

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U.S.S.R. (Contd.):

FREEZERSHIPS FISH SARDINES OFF AFRICAN WEST COAST:

Russian freezerships have fished sardines off the west coast of Africa, according to a report of the annual International Refrigeration Institute meeting in Moscow, published in Fiskaren, a Norwegian fishery trade paper. The catches were frozen on board the vessel. The frozen sardines were landed in Russia and canned. The results were so good that additional vessels are expected to participate.

The Russians also reported that they cooled small herring anchovies immediately after they were caught. Cooling was accomplished by pumping the small fish in ice-cold ocean water through a hose 10 cm. (almost 4 inches) in diameter which was 30 meters (98 feet) long.

United Kingdom

PRESERVATION OF FISH BY IRRADIATION STUDIED:

Significant increases in the keeping properties of fish have been achieved by subjecting them to irradiation, according to Food Investigation, 1957, published by the British Department of Scientific and Industrial Research.

Samples of haddock, mackerel, herring, cod, and sole were irradiated at Harwell in an experiment by the staff of the Torry Research Station and the Low Temperature Research Station. Cod and sole were least affected in odor and flavor by irradiation, while cod exposed to comparatively low doses of radiation were found to remain palatable for 13 days, compared with 9 for untreated fish of the same kind.

The best results were obtained with fish which had been irradiated and then treated with an antibiotic solution. These remained edible for 23 days when stored at freezing temperatures.

The report also contains information on experiments carried out to determine the usefulness of freezing at sea as a means of preserving fish.

ROLE OF FISHERY PRODUCTS IN FAMILY FOOD PURCHASES

Approximately 28 percent of all spending for food is for meat, poultry, and fish, according to Nation's Business. The proportion expended for each remains fairly constant at all income levels. When incomes rise, a larger proportion is then spent for beef and turkey, and a smaller proportion for pork, chicken, and fish.

The average family spends $380 a year for meat, poultry, and fish. Approximately $295 is spent for meat as follows: $125 for beef, $105 for pork, and $38 for hot dogs and other luncheon meats. Spending for poultry is $55, whereas only $30 is spent for fish. This is $8.00 less than the amount for hot dogs and other luncheon meats. The bulk of the expenditures for fish are for the frozen and canned varieties.

This presents a challenge. Since indications are that beef supplies will not be as heavy during the next two years, we must make every effort to increase the consumption of fishery products and thus obtain a larger share of the protein food market.

FEDERAL ACTIONS

Federal Trade Commission

BROKER OF SEAFOOD PRODUCTS ADMITS "TECHNICAL VIOLATIONS" OF ILLEGAL BROKERAGE LAW:

Replying (Answer 7024 Seafood Products) to Federal Trade Commission charges of granting illegal brokerage to some customers, a Seattle broker of seafood products on October 10, 1958, conceded his challenged payments might be "technical violations" of law, but declared they were made to increase rather than injure competition.

The Commission charged in its complaint of July 23, 1958, that the broker favored certain buyers, or their agents, with large allowances in lieu of brokerage through price concessions or rebates. The complaint alleged this practice violates Sec. 2(c) of the Robinson-Patman Amendment to the Clayton Act.

In his answer, the broker states that, in order to reduce freight costs and delays in delivery, buyers normally obtain their basic stock in one combination order covering several types of seafood.

Admitting that price concessions have been offered to obtain such large orders, he asserts this is done when a buyer objects to a particular item's price and the packer refuses to reduce it. The broker must absorb the difference or lose the sale, but this does not mean that the price actually given was inconsistent with the market, he continues.

Asserting that he is a small operator, the broker points out that his gross sales and net income were less than $400,000 and $4,500, respectively, in 1956. During that year he admits making price reductions totaling $565 in 16 transactions invoiced at $79,000.

Summing up, the broker "concedes that within the transactions questioned may be found technical violations ... as by the Commission contended, but respectfully submits that such violations, were they not considered per se, in no way injured the public, were in furtherance of, rather than restraint of competition, and thus tended to preserve rather than defeat the purpose of the antitrust laws."

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CONSENT ORDER PROHIBITS SEAFOOD PACKER FROM PAYING ILLEGAL BROKERAGE:

A consent order (7147, Seafood), requiring a Washington State seafood packing company to stop making illegal brokerage payments to its customers, was approved by the Federal Trade Commission on November 10, 1958.

This action represents the adoption by the Commission of an initial decision by one of its hearing examiners based on an order agreed to by the company and the Commission's Bureau of Litigation.

A Commission complaint, issued on May 8, 1958, said the company generally sells its canned salmon pack through brokers who are paid commissions ranging from 2 to 5 percent. However, the complaint charged, the company made many sales to brokers purchasing for their own account for resale, and granted them discounts or allowances in lieu of brokerage. Section 2(c) of the Amended Clayton Act forbids this practice.

Joined in the order is the company's president and treasurer.

The agreement is for settlement purposes only and does not constitute an admission by the respondents that they have violated the law.

Interstate Commerce Commission

TRANSPORTATION ACT OF 1958 FISHERY EXEMPTION TRUCK AMENDMENT INCLUDES SPECIALTY PRODUCTS:

The Bureau of Motor Carriers, Interstate Commerce Commission (I.C.C.), issued late in 1958 Ruling 110 which clears up most of the questions about the fishery exemption amendment (exempts fresh and frozen fishery products and specialties from I.C.C. regulated motor carrier regulations) in the Transportation Act of 1958. The fishing industry was in doubt as to how I.C.C. would consider specialty items such as fish dinners and fish cakes because the "basic ingredient" principle was deleted from the Act prior to passage.

In addition to the usual fresh and frozen fishery products, Ruling 110 specifically shows the following fishery items as exempt: Fish (including shellfish): breaded, cooked or uncooked, frozen or fresh; cakes, codfish, cooked or uncooked, frozen or fresh; clam juice or broth, cooked or uncooked, frozen or fresh; cooked or partially cooked fish or shellfish, frozen or fresh; croquettes, salmon, cooked or uncooked, frozen or fresh; deviled crabs, clams, or lobsters, cooked or uncooked, frozen or fresh; dinners, cooked or uncooked, frozen or fresh; fried fish fillets, oysters, or scallops, frozen or fresh; sticks, cooked or uncooked, frozen or fresh.

The Ruling also points out that imported fishery products have the same status as domestic.

A spokesman for the I.C.C. said that canned salted fish would be exempt if the canning process or the salting process was not a treatment for preserving. In other words, if it were necessary to include some other preserving media such as refrigeration, it would likely be considered exempt. Also oyster stew that is frozen uncooked would probably qualify, but cooked oyster stew would be nonexempt.

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TRUCKERS REQUIRED TO AMEND "GRANDFATHER RIGHTS" APPLICATION TO INCLUDE FRESH AND FROZEN FISH:

Shippers of less than truckloads of fresh or frozen fish and shellfish were reminded by the Interstate Commerce Commission (F.C.C.) of the December 10, 1958, deadline for motor carriers to file applications under "grandfather rights." Those shippers using carriers that carry, for example, frozen fruits and vegetables in the same truck with fresh and frozen fishery products were affected.

Carriers who desired common or contract carrier rights could amend their application for "grandfather rights" to include fresh and frozen fishery products. If a carrier who was satisfactory to shippers failed to amend his application for "grandfather rights," that carrier is excluded from carrying exempt fishery products in the same truck with regulated products.

Applications for "grandfather rights" were to be made on Form BOR-1 for those "exempt" carriers who were carrying before May 1, 1958, commodities that became regulated August 12, 1958. For those carrying those commodities subsequent to May 1, 1958, applications for "Interim" rights were made on Form BOR-2. The application forms do not provide for other "exempt" commodities that did not become regulated even though the carriers had been handling that type of commodity. Through the efforts of fishing industry representatives, the I. C. C. issued "Second Supplement to Information Bulletin No. 1" which provides that applicants may make an amendment to the application to include commodities still in the "exempt" category.

The Interstate Commerce Act provides that "for hire" motor shipment in interstate and foreign commerce of "exempt" commodities in the same truck with "nonexempt" commodities, subjects the "exempt" commodities (fresh and frozen fishery products) to both economic and safety regulation. Therefore, truck operators must also have rights for fishery products to haul those products mixed with regulated products.

Department of the Interior

FISH AND WILDLIFE SERVICE

ADDITIONAL HEARINGS ON COMMERCIAL FISHING REGULATIONS HELD:

Six additional public hearings on the 1959 Alaska commercial fishing regulations were held in Alaska in accordance with instructions received from the Secretary of the Interior on November 19, 1958.

Thus, in accordance with past practice, hearings were held in eight fishing communities in Alaska and in Seattle, Wash., on the proposed regulations.

The original announcement scheduled hearings in Seattle on December 4, 5, and 6; in Juneau on December 10, 11, and 12; and in Anchorage on December 17, 18, and 19. The additional Alaska hearings were scheduled for Kodiak (Jan. 6, 1959), Dillingham (Jan. 7), Cordova (Jan. 9), Sitka (Jan. 12), Wrangell (Jan. 8), and Ketchikan (Jan. 6).

The Secretary on November 8, 1958, instructed the U. S. Fish and Wildlife Service to propose the elimination of fish traps in Alaska in order that the Department of the Interior could adjust its "actions as quickly as possible to the desires of the Alaskans in regard to the disposition of their natural resources." Every effort will be made to publish the 1959 Alaska fishing regulations as early as possible. The fishing season normally opens around May 1.

After visiting with many Alaskans on his current trip to Alaska--his fourth since he became Secretary of the Interior--the Secretary informed the Bureau of Commercial Fisheries that the keen interest and concern shown by Alaskans in their fishery resources prompted him to expand the original schedule of public hearings. At these additional local hearings fishermen throughout Alaska will have an opportunity to discuss the fisheries conservation program and express their views on regulation changes needed for the coming year.

As announced by the Secretary on November 8, 1958, in the annual Notice of Intention to adopt amendments to existing Alaska fishing regulations, all interested persons were invited to present their views in writing to the Director, Bureau of Commercial Fisheries, or in person at the public hearings.

Note: Also see Commercial Fisheries Review, December 1958, p. 86.

BUREAU OF COMMERCIAL FISHERIES

PROPOSED FROZEN HADDOCK FILLET GRADE STANDARDS:

Proposed United States grade standards for frozen haddock fillets were published in the November 8, 1958, Federal Register. These regulations, when effective, will be the first issued by the Department of the Interior prescribing grade standards for frozen haddock fillets.

The proposed standards describe the product and grades, recommended weights and dimensions, quality factors, definitions and methods of analysis, lot certification tolerances, and score sheets.

The notice of proposed rule making as published in the Federal Register follows:

Fish and Wildlife Service

[50 CFR Part 174]

UNITED STATES STANDARDS FOR GRADES OF FROZEN HADDOCK FILLETS [1]

NOTICE OF PROPOSED RULE MAKING

Notice is hereby given, pursuant to section 4 (a) of the Administrative Procedure Act of June 11, 1946 (60 Stat. 238, 5 U. S. C. 1003), that the Director of the Bureau of Commercial Fisheries proposes to recommend to the Secretary of the Interior the adoption of the regulations set forth in tentative form below to establish grade standards for frozen haddock fillets. These regulations are to be codified as Title 50, Code of Federal Regulations, Part 174—United States Standards for Grades of Frozen Haddock Fillets, and are proposed for adoption in accordance with the authority contained in Title II of the Agricultural Marketing Act of August 14, 1946, as amended (7 U. S. C. 1621–1627). Functions under that act pertaining to fish, shellfish, and any products thereof were transferred to the Department of the Interior by section 6 (a) of the Fish and Wildlife Act of August 8, 1956 (16 U. S. C. 742e). These regulations, if made effective, will be the first issued by the Department of the Interior prescribing grade standards for frozen haddock fillets.

Prior to the final adoption of the proposed regulations set forth below, consideration will be given to any written data, views, or arguments relating thereto which are received by the Director, Bureau of Commercial Fisheries, Fish and Wildlife Service, Washington 25, D. C., on or before November 20, 1958.

Dated: November 4, 1958.

A. W. ANDERSON,
Acting Director,
Bureau of Commercial Fisheries.

[1] Compliance with the provisions of these standards shall not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act.

PRODUCT DESCRIPTION AND GRADES

PRODUCT DESCRIPTION AND GRADES

§ 174.1 *Product description.* The product described in this part consists of clean, whole, wholesome fillets or pri-

marily large pieces of clean, whole, wholesome fillets, cut away from either side of a haddock, Melanogrammus aeglefinus; the fillets may be either skinless or with skin on. They are packaged and frozen in accordance with good commercial practice and are maintained at temperatures necessary for the preservation of the product. (This part does not provide for the grading of pieces of fish flesh cut away from previously frozen fish blocks, slabs, or similar products.)

§ 174.2 *Grades of frozen haddock fillets.* (a) "U. S. Grade A" is the quality of frozen haddock fillets which possess a good flavor and odor; and for those factors which are rated in accordance with the scoring system outlined in this part have a total score of 85 to 100 points.

(b) "U. S. Grade B" is the quality of frozen haddock fillets which possess at least a reasonably good flavor and ordor; and for those factors which are rated in accordance with the scoring system outlined in this part have a total score of not less than 70 points: *Provided*, That no factor receives maximum point score deduction.

(c) "Substandard" is the quality of frozen haddock fillets which fail to meet the requirements of U. S. Grade B.

WEIGHTS AND DIMENSIONS

§ 174.6 *Recommended weights and dimensions.* (a) The recommendations as to net weights and dimensions of packaged frozen haddock fillets are not incorporated in the grades of the finished product since net weights and dimensions, as such, are not factors of quality for the purpose of these grades.

(b) It is recommended that the net weights of the packaged frozen haddock fillets be not less than 12 ounces and not over 10 pounds.

FACTORS OF QUALITY

§ 174.11 *Ascertaining the grade.* The grade of frozen haddock fillets is ascertained by observing the product in the frozen and thawed states and after representative portions have been cooked in a suitable manner. The following factors are evaluated in ascertaining the grade of the product: Flavor, odor, appearance, size, defects, and character.

(a) These factors are rated in the following manner:

(1) *Flavor and odor.* These factors are rated directly by organoleptic evaluation. Score points are not assessed (see § 174.12).

(2) *Appearance, size, defects, and character.* These factors are rated by score points expressed numerically on the scale of 100.

(b) The four factors and the maximum number of points that may be given each are as follows:

Factors:	Points
Appearance	25
Size	20
Defects	40
Character	15
Total score	100

§ 174.12 *Evaluation of the unscored factor of flavor and odor.*—(a) *Good flavor and odor.* "Good flavor and odor" (essential requirement for a Grade A product) means that fish flesh has good flavor and odor characteristic of haddock (Melanogrammus aeglefinus); and is free from staleness, and off-flavors and off-odors of any kind.

(b) *Reasonably good flavor and odor.* "Reasonably good flavor and odor" (minimum requirement of a Grade B product) means that the fish flesh may be somewhat lacking in good flavor and odor; and is free from objectionable off-flavors and off-odors of any kind.

§ 174.13 *Ascertaining the rating for the factors which are scored; appearance, size, defects, and character.* The essential variations within each factor which is scored are so described that the value may be ascertained for each factor and expressed numerically. Point deductions are alloted for each degree or amount of variation within each factor. The value for each factor is the maximum number of points allotted for the factor less the sum of the deduction-points within the factor.

§ 174.14 *Appearance.* (a) General: The factor of appearance refers to the color of the fish flesh, and to the degree of surface dehydration of the product.

(b) For the purpose of rating the factor of appearance the schedule of deduction-points in Tables I and II apply. Haddock fillets which receive 25 deduction points for this factor shall not be graded above Substandard regardless of the total score for the product. This is a limiting rule.

TABLE I—SCORE DEDUCTIONS FOR COLOR SUBFACTOR

Color	Deduction points	
	"Light" colored portion comprising main portion of fillet	"Dark" colored portion occurring under skin mainly along lateral line
No discoloration	0	0
Slight yellowing	2	1
Moderate yellowing	4	3
Excessive yellowing and/or any rusting	13	12

TABLE II—SCORE DEDUCTIONS FOR DEHYDRATION SUBFACTOR

Degree of dehydration	Surface area affected (percent)		Deduction points
	Over—	Not over—	
Slight—Shallow and not color masking	0	1	0
	1	50	2
	50	100	4
Moderate—Deep but just deep enough to easily scrap off with fingernail	1	25	8
	25	50	8
	50	100	16
Excessive—Deep dehydration not easily scraped off	1	25	12
	25	100	25

TABLE III—SCORE DEDUCTIONS FOR SIZE OF FILLET PIECES

Number of fillet pieces less than 2 ounces per pound		Deduction points
Over—	Not over—	
	0	0
0	1	1
1	2	10
2	3	15
3	4	20

§ 174.15 *Size.* (a) General: The factor of size refers to the maximum number of small pieces under 2 oz. allowed per pound.

(b) For the purpose of rating the factor of size the schedule of deduction-points in Table III apply. Haddock fillets which receive 20 deduction points for this factor shall not be graded above Substandard regardless of the total score for the product. This is a limiting rule.

§ 174.16 *Defects.* (a) General: The factor of defects refers to the degree of freedom from improper packing, cutting and trimming imperfections, blemishes, and bones.

(1) *Improper packing.* "Improper packing" means poor arrangement of fillets, presence of voids, depressions, frost, and the imbedding of packaging material into fish flesh.

(2) *Cutting and trimming imperfections.* "Cutting and trimming imperfections" means that the fillets have ragged edges, tears, holes, or are otherwise improperly cut or trimmed.

(3) *Blemish.* "Blemish" means a piece of skin (except for skin-on fillets), scales, blood spot, a bruise, a black belly lining, a fin, or extraneous material. One "piece of skin" consists of one piece at least ½ square inch in area; except that any skin patches larger than 1½ square inches shall each be considered as two pieces of skin. "Blood spot" is one of such size and prominence as to be considered objectionable. "Black belly lining" is any piece longer than ½ inch. Each aggregate area up to 1 square inch of identifiable fin or parts of any fin shall be considered as one "instance of fin". Each aggregate area up to 1 square inch per fillet of one scale or group of scales shall be considered one "instance of scales". "A bruise" consists of an affected area of ½ square inch or more in area; except that any bruise larger than 1½ square inches shall each be considered as two bruises.

(4) *Bones.* "Bones" means any bones that can be identified, and are objectionable. One instance of bone means one bone or one group of bones occupying

TABLE IV—SCORE DEDUCTIONS FOR DEFECTS

Defects, subfactors	Method of determining subfactor score	Deduction points
Improper packing.	Moderate defects, noticeably affecting the products appearance.	2
	Excessive defects, seriously affecting products appearance.	4
Blemishes	Number of blemishes per 1 lb. of fish flesh:	
	Over 0 not over 1	1
	Over 1 not over 2	3
	Over 2 not over 3	8
	Over 3 not over 4	8
	Over 4 not over 5	18
	Over 5 not over 6	30
	Over 6	40
Bones	Number of instances per 1 lb. of fish flesh:	
	Over 0 not over 1	0
	Over 1 not over 2	5
	Over 2 not over 3	10
	Over 3 not over 4	15
	Over 4 not over 5	30
	Over 5	40
Cutting and trimming.	Slight defects, scarcely noticeable.	0
	Moderate defects, noticeable but not affecting the usability of any fillets.	4
	Excessive defects impairing:	
	(a) the usability of up to ¼ of the total number of fillets.	8
	(b) the usability of over ¼ but not more than ½ of the total number of fillets.	16
	(c) the usability of over ½ of the total number of fillets.	40

or contacting a circular area of 1 square inch.

(b) For the purpose of rating the factor of freedom from defects, the schedule of deduction-points in Table IV apply.

§ 174.17 *Character.* (a) General: The factor of character refers to the amount of drip in the thawed fillets, and to the tenderness and moistness of the properly cooked fish flesh.

(b) For the purpose of rating the factor of character, the schedule of deduction-points in Table V apply. Haddock fillets which receive 15 deduction points for this factor shall not be graded above Substandard regardless of the total score for the product. This is a limiting rule.

TABLE V—SCORE DEDUCTIONS FOR CHARACTER

Character, subfactors	Method of determining subfactor score	Deduction points
Texture	Texture of the cooked fish:	
	(a) Firm, slightly resilient but not tough or rubbery; moist but not mushy.	0
	(b) Moderately firm; only slightly tough or rubbery; does not form a fibrous mass in the mouth; moist but not mushy.	4
	(c) Moderately tough or rubbery; has noticeable tendency to form a fibrous mass in the mouth; or is dry; or is mushy.	8
	(d) Excessively tough or rubbery; has marked tendency to form a fibrous mass in the mouth; or is very dry; or is very mushy.	15
Amount of drip	Percent of drip:	
	Over 0 not over 5	0
	Over 5 not over 6	1
	Over 6 not over 8	2
	Over 8 not over 10	4
	Over 10 not over 12	6
	Over 12 not over 14	9
	Over 14 not over 16	12
	Over 16	15

DEFINITIONS AND METHODS OF ANALYSIS

§ 174.21 *Definitions and methods of analysis.*—(a) *Percent of drip.* "Percent of drip" means the percent by weight of "free drip" (the fluid which is not reabsorbed by the fish tissue when the frozen fish thaws, and which separates freely without the aid of any external forces except gravity) in an individual package as determined by the following method:

(1) *Apparatus and materials.* (i) Water bath.

(ii) Balance, accurate to 0.1 gm; or 0.01 ounce.

(iii) Pliable and impermeable bag (cryovac, pliofilm, etc.).

(iv) Vacuum source (Vacuum pump or water aspirator).

(v) U. S. Standard No. 8 mesh circular sieve (both 8 and 12 inch diameters).

(vi) Stirring motor.

(vii) Identification tags.

(2) *Procedure.* (i) Weigh pliable and impermeable bag (cryovac, pliofilm, etc.).

(ii) Remove frozen material from container (container consists of the carton and the inner and outer wrappings).

(iii) Place frozen product, plus scraps of any material remaining on the container, into the pliable bag.

(iv) Weigh bag and contents and subtract tare to determine the net weight of the product.

(v) Evacuate air from bag by use of suction so that bag closely fits contour of product, with no air pockets.

(vi) Crimp the open end of bag and tie off (a secure and leakproof closure may be created by tying close to product and then folding excess bag and tying again).

(vii) Completely immerse bag and contents in a circulated water bath maintained at 68° F. plus or minus 2° F.

(viii) Allow to remain immersed until the product is defrosted (a "test run", in advance, is necessary to determine time required for each product and quantity of product).[2]

(ix) Remove bag and contents from bath and gently dry outside of bag.

(x) Open bag and empty contents onto U. S. Standard No. 8 circular sieve so as to distribute the product evently, inclining the sieve slightly to facilitate drainage, and allowing to drain for two minutes.

(xi) Weigh sieve and its contents and calculate drained weight. The drained weight is the weight of sieve and fillets less the weight of the dry sieve.

(xii) Calculate percent drip:

$$\frac{\text{Net weight (iv)} - \text{drained weight (xi)}}{\text{Net weight}} \times 100 = \text{Percent of drip}$$

(b) *Cooking in a suitable manner.* "Cooking in a suitable manner" shall mean that the product is cooked as follows: Place the thawed unseasoned product into a boilable film-type pouch. The pouch and its contents are then immersed in boiling water and cooked until the internal temperature of the fillets reaches 160° F. (about 20 minutes).

LOT CERTIFICATION TOLERANCES

§ 174.25 *Tolerances for certification of officially drawn samples.* The sample rate and grades of specific lots shall be certified in accordance with Part 170 of this chapter (regulations governing processed fishery products, 23 F. R. 5064, July 3, 1958).

§ 174.31 *Score sheet for frozen haddock fillets.*

Label: .....
Size and kind of container: .....
Container mark or identification: .....
Size of lot: .....
Number of packages per master carton: .....
Size of sample: .....
Type of overwrap: .....
Actual net weight: ..... (lb.) ..... (kg.)

Factor	Standards score points	Sample score
Appearance	25	
Uniformity	20	
Defects	40	
Character	15	
Total	100	

Flavor and odor .....
Final grade .....

[2] The purpose of the "test run" is to determine the time necessary to thaw the product. The complete thawing of the product is determined by frequent but gentle squeezing of the bag until no hard core or ice crystals are felt. This package which has been squeezed can not be used for drained weight calculations.

Department of Labor

PUERTO RICO FOOD PRODUCTS INDUSTRY COMMITTEE RECOMMENDS HIGHER MINIMUM WAGE FOR TUNA CANNING:

A minimum wage rate in Puerto Rico of 85 cents an hour for tuna canning operations was found as economically feasible by the U. S. Department of Labor Industry Committee No. 41-B for the Food and Related Products Industry in Puerto Rico. This was included in the report, findings of fact, and recommendations made by the Committee after hearings held in Puerto Rico September 11-15, 1958.

Under the yeast and canned tuna industry classification, the Committee's findings on tuna canning were as follows:

"This classification is presently composed of two establishments employing a total of 367 persons covered by the minimum wage provisions of the Fair Labor Standards Act ...

"The record reveals that under the provisions of a union contract prevailing in the tuna fish cannery, wage rates range from 65 cents an hour, the currently effective minimum wage rate, to $1.40 an hour, and that average hourly earnings in the plant amounted to slightly over 70 cents an hour during a recent payroll period. Profits on sales of this establishment amounted to 9.7 percent during the year ended May 31, 1958, and, according to testimony, for that year profit on investment amounted to 9 percent. The firm, which had a deficit as of March 30, 1957, had an earned surplus of almost $625,000 as of May 31, 1958.

"On the other hand, the record reveals that competition in the canning of tuna and tunalike fish and related activities is relatively intense. Also,

imports of canned tuna fish from Japan increased from $14.3 million in 1956 to $16.2 million in 1957. Although data on such imports in early 1958 indicate that they are below comparable period 1957 levels, the Committee feels that they are of significance. Furthermore, the Committee finds that an offset in the minimum wage rate in Puerto Rico is justified on the basis of peculiar costs deriving from operation of an establishment of this kind in Puerto Rico.

"On the basis of these facts and on the entire record, the Committee finds that a minimum wage rate of 85 cents an hour for this classification is economically feasible. The Committee finds that this rate will directly affect a fairly substantial number of employees but will not result in substantial curtailment of employment."

Treasury Department

COAST GUARD

HEARINGS HELD TO IMPLEMENT FEDERAL BOATING ACT OF 1958:

The proposed changes in maritime safety standards and regulations to implement the Federal Boating Act of 1958 were published in the Federal Register of November 1, 1958. Undocumented fishing vessels of all types of more than 10 hp. will be affected. A public hearing was held by the Merchant Marine Council on December 9, 1958, in Washington, D. C., to receive comments, views, and data on the proposed standards and regulations as set forth in Items I to III, inclusive, of the Merchant Marine Council Public Hearing Agenda (CG-249), dated December 9, 1958, and in the Federal Register of November 1, 1958.

The unprecedented boom in the use of small vessels, principally pleasure craft, on the waterways of the nation prompted Congress to pass the Federal Boating Act of 1958. This Act modernizes Federal boating laws and provides means for meeting the current needs for greater safety. Briefly, this Act provides:

(a) Effective immediately, the operator of a vessel shall stop and render assistance if involved in a boating accident, and shall furnish his identification to others involved. Further, the operator is required to give notice to and file a written report with the cognizant authorities.

(b) The Coast Guard is authorized to impose civil penalties for reckless or negligent operation of vessels, including pleasure craft of all types.

(c) Every State may assume concurrent jurisdiction on navigable waters of the United States within such State and enter into enforcement agreements with the Federal government.

(d) The present Coast Guard system for numbering of undocumented vessels shall be continued until April 1, 1960, unless a State assumes the functions of numbering prior to that date. On and after April 1, 1960, the Coast Guard will re-number all undocumented vessels propelled by machinery of more than 10 horsepower, unless a State shall have assumed the functions of numbering within that State. An undocumented vessel is one without a marine document issued by the Bureau of Customs.

(e) The Coast Guard shall compile, analyze, and publish information obtained from reports of boating accidents together with the findings concerning the causes of such accidents and recommendations for their future prevention.

(f) The Coast Guard shall establish standards, rules and regulations with respect to some of these functions as described in the law.

The Secretary of the Treasury by Treasury Department Orders 120, dated July 31, 1950 (15 F. R. 6521), and 167-32, dated September 23, 1958 (23 F. R. 7605), assigned the functions in the Act of April 25, 1940, as amended (46 U. S. C. 526-526t), and the Federal Boating Act of 1958 to the Commandant of the Coast Guard.

The proposed standards, rules and regulations required to be prescribed are set forth in the November 1 Federal Register. For convenience, the proposals are divided into three categories, as follows:

Item I - System of Numbering and Statistical Information Applicable to Undocumented Vessels (46 CFR Parts 170-173).

Item II - Boating Accidents Involving Undocumented Vessels (46 CFR Part 136).

Item III - Boarding Undocumented Vessels (46 CFR Part 26).

The proposals in Item I describe the Federal standards for numbering undocumented vessels as well as the requirements for statistical information to be obtained, compiled, analyzed and published.

The proposals in Item II are requirements applicable to the operators of vessels involved in boating accidents. It is proposed to require both a notice and a written report about each reportable boating accident, which will be submitted by the operator of the undocumented vessel. These boating accident reports will be a primary source of information on which statistics will be based, as well as a basis for recommendations for promoting safety of life and property and the prevention of elimination of similar accidents in the future.

The proposal in Item III describes the procedures to be followed in the enforcement of these laws.

Vessel as set forth in subsection 2 (2) of the Federal Boating Act of 1958 "includes every description of watercraft, other than a seaplane on the water, used or capable of being used as a means of transportation on water." This definition includes, but is not limited to, motorboats, sailboats, rowboats, canoes, ships, tugs, towboats, ferries, cargo vessels, passenger vessels, tank vessels, fishing vessels, charter boats, party boats, barges, scows, etc.

NEW TYPE HEADLINE ROPE DEVELOPED

A new type of headline rope developed by the Nanaimo Biological Station, B.C., Canada, is constructed of preformed, alternate, lay galvanized wire rope, sheathed with braided spun nylon rope. It has proved successful in midwater trawls and ocean perch nets.

The braided nylon sheathing eliminates slippage of knots in hanging netting to the headline. The sheathing is marked with a continuous red line to assist in preventing twists and turns being placed in the rope when hanging the netting. The rope can be easily spliced by paring away the nylon sheathing and covering the area with a synthetic tape (National Fisherman, May 1958).

Editorial Assistant--Ruth V. Keefe Illustrator--Gustaf T. Sundstrom

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* * * * *

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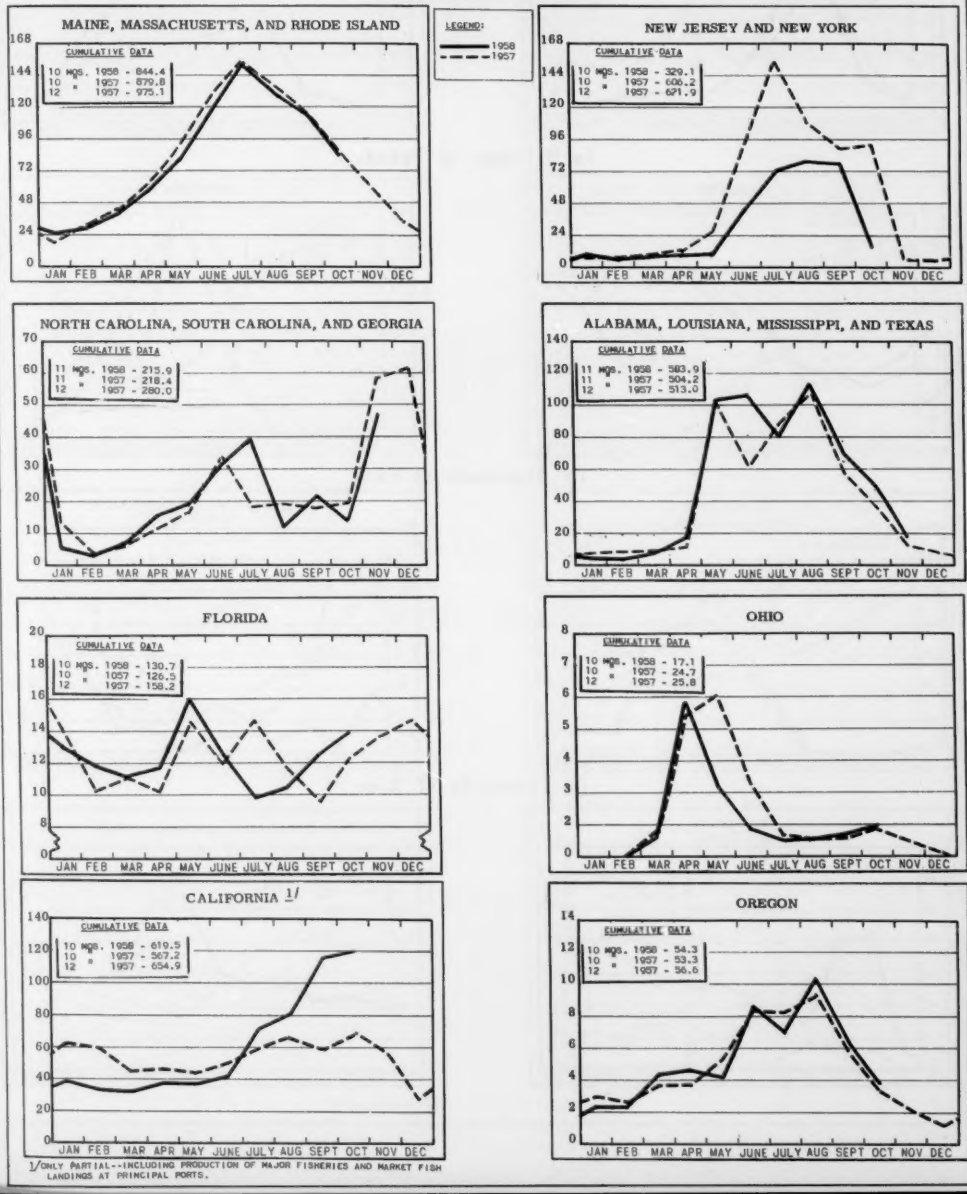
FISHERY INDICATORS

CHART 1 - FISHERY LANDINGS for SELECTED STATES

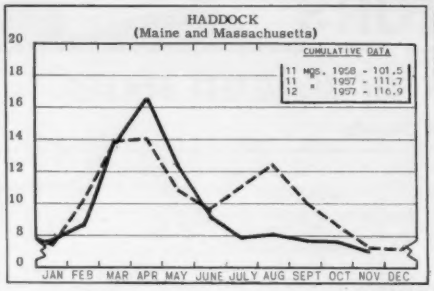
In Millions of Pounds

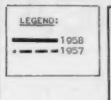


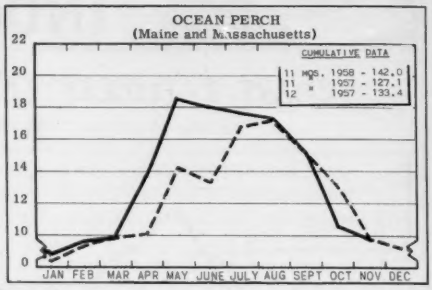
1/ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

CHART 2 - LANDINGS for SELECTED FISHERIES

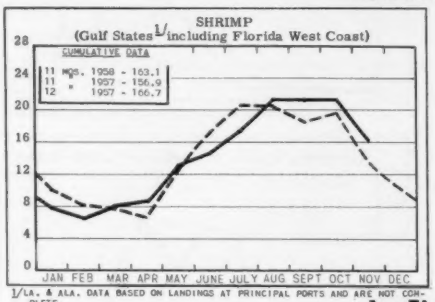
In Millions of Pounds



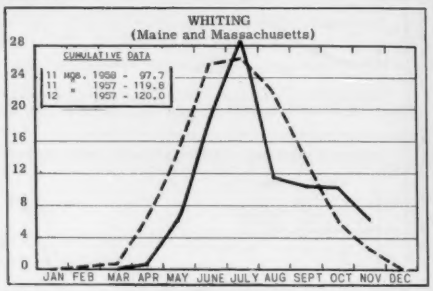




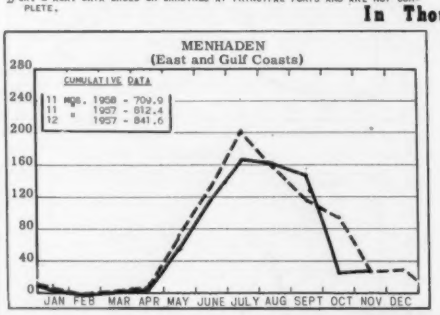
In Millions of Pounds

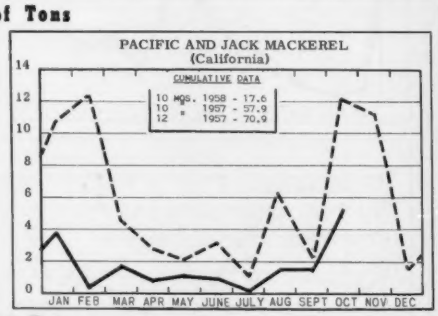


1/ LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

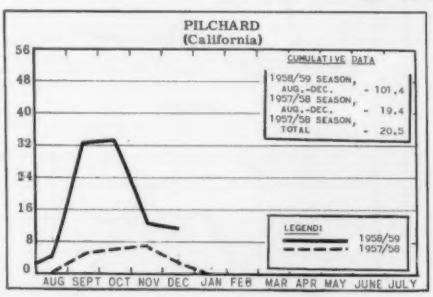


In Thousands of Tons





In Thousands of Tons



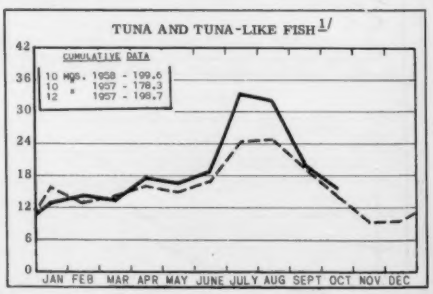
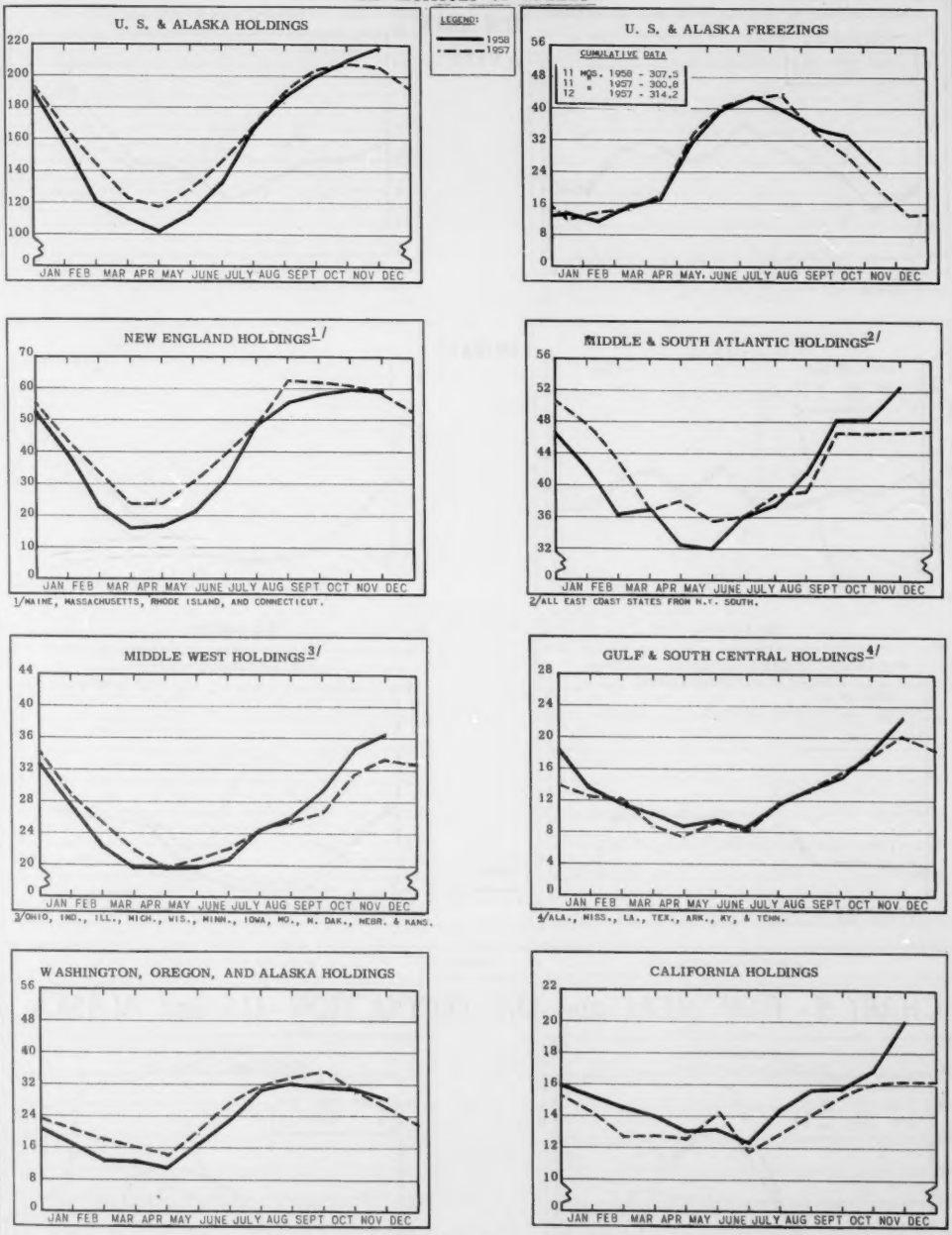


CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

In Millions of Pounds



1/MAINE, MASSACHUSETTS, RHODE ISLAND, AND CONNECTICUT.

2/ALL EAST COAST STATES FROM N.Y. SOUTH.

3/OHIO, IND., ILL., MICH., WIS., MINN., IOWA, MO., N. DAK., NEBR. & KANS.

4/ALA., MISS., LA., TEX., ARK., KY., & TENN.

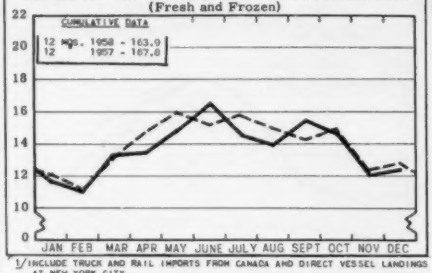
* Excludes salted, cured, and smoked products.

CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

In Millions of Pounds

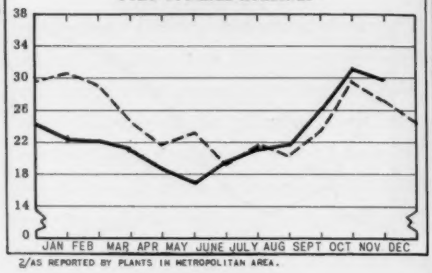
NEW YORK CITY

RECEIPTS[1/] AT WHOLESALE SALT-WATER MARKET (Fresh and Frozen)



1/INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS AT NEW YORK CITY.

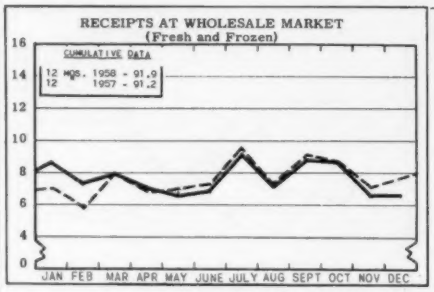
COLD-STORAGE HOLDINGS[2/]



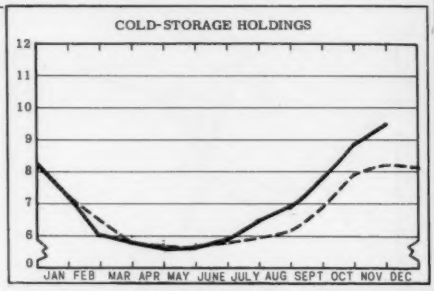
2/AS REPORTED BY PLANTS IN METROPOLITAN AREA.

CHICAGO

RECEIPTS AT WHOLESALE MARKET (Fresh and Frozen)

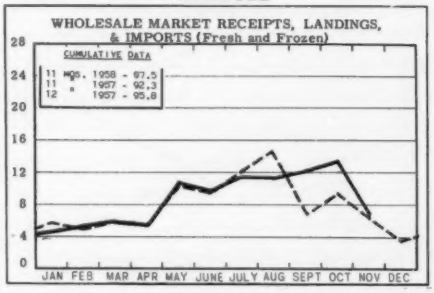


COLD-STORAGE HOLDINGS



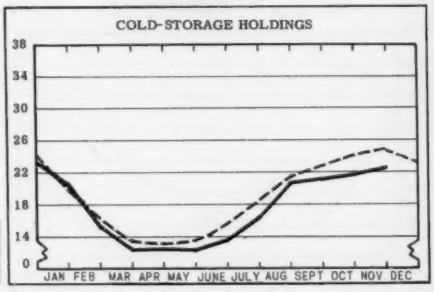
SEATTLE

WHOLESALE MARKET RECEIPTS, LANDINGS, & IMPORTS (Fresh and Frozen)



BOSTON

COLD-STORAGE HOLDINGS



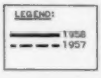
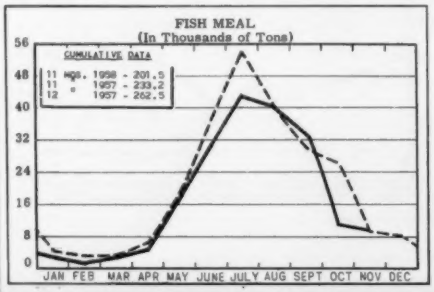


CHART 5 - FISH MEAL and OIL PRODUCTION - U.S and ALASKA

FISH MEAL (In Thousands of Tons)



FISH OIL (In Millions of Gallons)

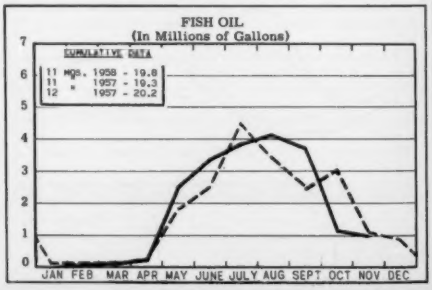
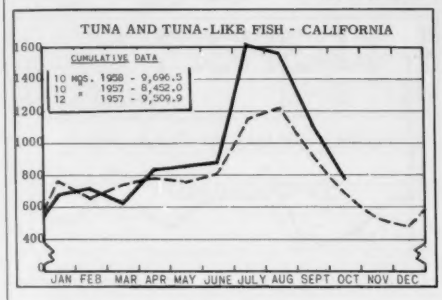
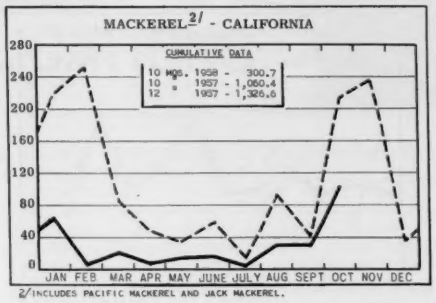


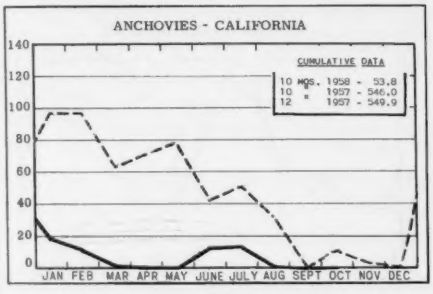
CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

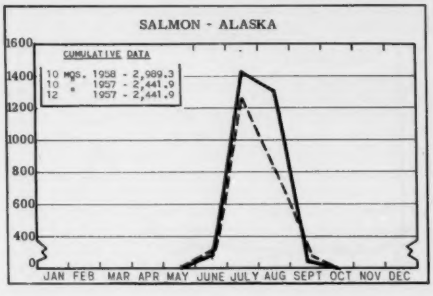
In Thousands of Standard Cases

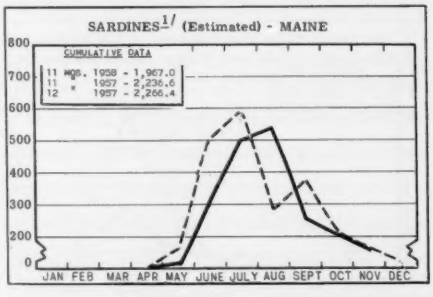




2/ INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.

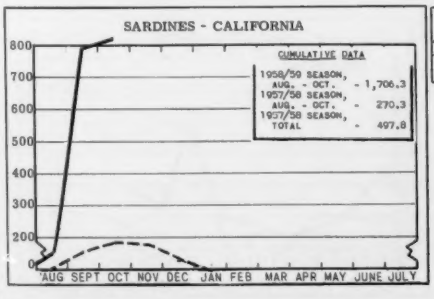






STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES.....	100	¼ drawn	3¾ oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	# ½ tuna	6 & 7 oz.
PILCHARDS...	48	# 1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES...	48	½-lb.	8 oz.



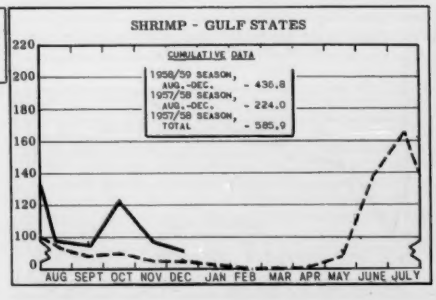
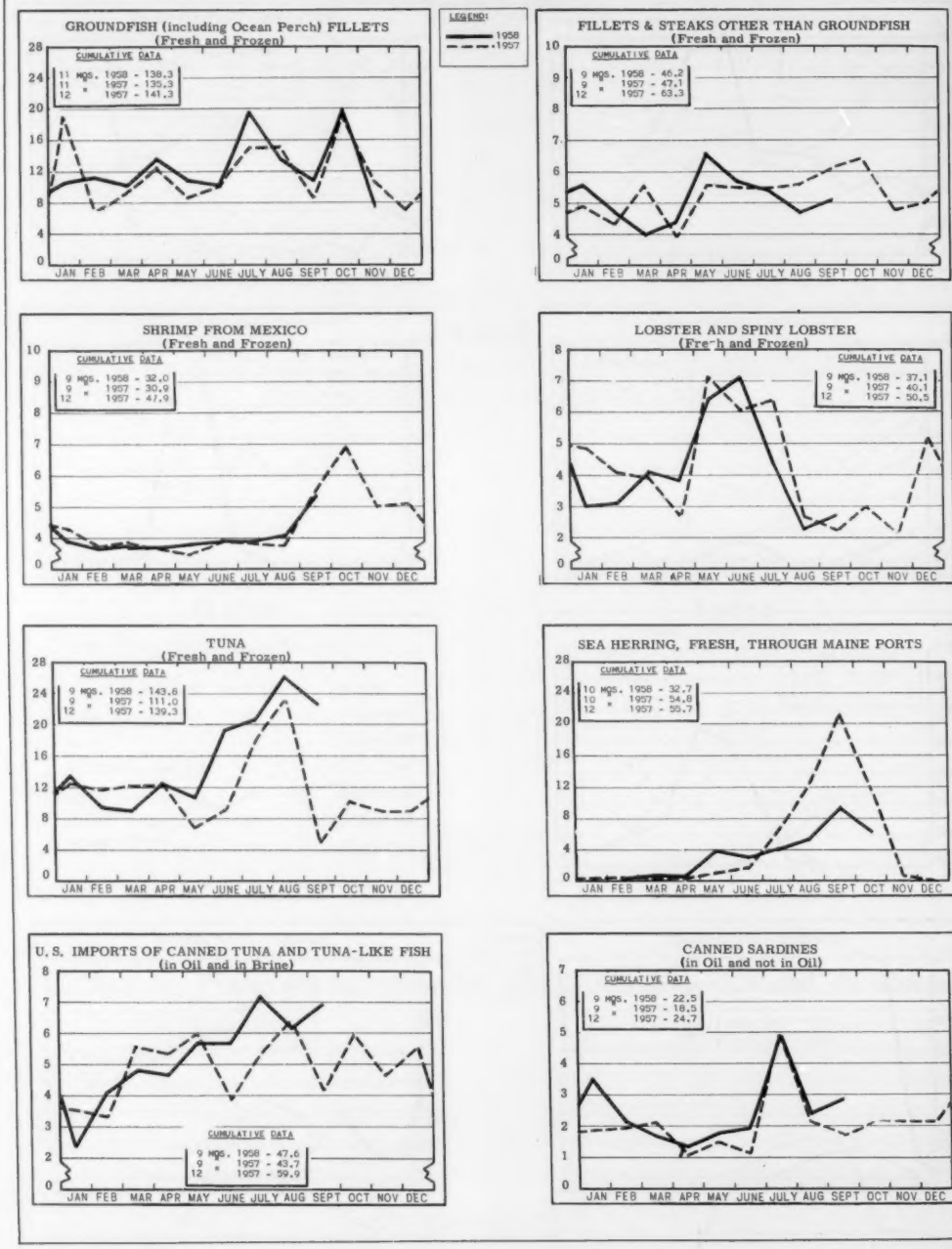
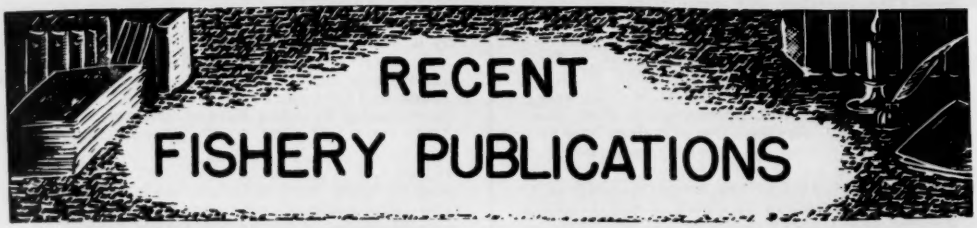


CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds





FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES AND ALASKA.
SL - STATISTICAL SECTION LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
FL - FISHERY LEAFLET.
SEP.- SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

Number — Title

CFS-1890 - Shrimp Landings, June 1958, 6 pp.
CFS-1898 - New Jersey Landings, August 1958, 3 pp.
CFS-1900 - Texas Landings, August 1958, 3 pp.
CFS-1905 - Frozen Fish Report, September 1958, 8 pp.
CFS-1907 - Lake Fisheries, 1957 Annual Summary, 12 pp.
CFS-1909 - New England Fisheries, 1957 Annual Summary, 8 pp.
CFS-1910 - Fish Stick Report, July-September 1958, 2 pp.
CFS-1911 - Louisiana Landings, April 1958, 2 pp.
CFS-1913 - Ohio Landings, September 1958, 2 pp.
CFS-1914 - Fish Meal and Oil, September 1958, 2 pp.
CFS-1915 - North Carolina Landings, September 1958, 3 pp.
CFS-1916 - New Jersey Landings, September 1958, 3 pp.
CFS-1917 - Georgia Landings, September 1958, 2 pp.
CFS-1919 - Mississippi Landings, August 1958, 2 pp.
CFS-1920 - Maine Landings, September 1958, 3 pp.
CFS-1921 - Florida Landings, September 1958, 6 pp.
CFS-1924 - South Carolina Landings, September 1958, 2 pp.
CFS-1926 - Louisiana Landings, May 1958, 2 pp.

Wholesale Dealers in Fishery Products (Revised):
SL- 3 - Massachusetts, 1958.
SL-12 - Virginia, 1957.
SL-16 - Florida, 1958.
SL-25 - Wisconsin (Great Lakes Area), 1958.

FL-160 - Partial List of Fishery Periodicals, 10 pp., Revised October 1958.

Sep. No. 531 - Certification and After-Use Measurement of Manila Otter-Trawl Cod Ends.

Sep. No. 532 - Bottom Trawling Explorations Off Southeastern Alaska, 1956-1957.

Sep. No. 533 - Research in Service Laboratories (December 1958): Contains these articles--"Technical Note No. 48 - Pacific Ocean Perch - Proximate Composition," and "Chlorinated Sea Water Helps to Improve Quality of Fish Aboard Fishing Vessels."

THE FOLLOWING SERVICE PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

California Fishery Products Monthly Summary, September 1958; _____, October 1958; 14 pp. each. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of tuna, mackerel, and anchovies, and sardines; market fish receipts at San Pedro, Santa Monica, San Diego, and Eureka areas; California imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; American Tuna Boat Association auction sales; for the months indicated.

(Chicago) Monthly Summary of Chicago's Fresh and Frozen Fishery Products Receipts and Wholesale Market Prices, October 1958, 12 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish, and shellfish; and wholesale prices for fresh and frozen fishery products; for the month indicated.

Gulf Monthly Landings, Production, and Shipments of Fishery Products, September 1958; _____, October 1958; 6 pp. each. (Market News Service, 609-611 Federal Bldg., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; and sponge sales; for the months indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, October 1958, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 So. King St., Hampton, Va.) Fishery landings and production for the Virginia areas of Hampton Roads, Lower Northern Neck, and Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and More-

head City; together with cumulative and comparative data; for the month indicated.

New England Fisheries--Monthly Summary, September 1958; _____, October 1958; 21 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Reviews the principal New England fishery ports, and presents food fish landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and landings and ex-vessel prices for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange; for the months indicated.

(Seattle) Monthly Summary - Fishery Products, October 1958, 6 pp. (Market News Service, U. S. Fish and Wildlife Service, Pier 42 South, Seattle 4, Wash.) Includes landings and local receipts, with ex-vessel and wholesale prices in some instances, as reported by Seattle and Astoria (Ore.) wholesale dealers; also Northwest Pacific halibut landings; and Washington shrimp landings; for the month indicated.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ANCHOVIES:

Biometric Comparison of the Anchoveta, CETENGRAULIS MYSTICETUS (Gunther), From Ten Localities of the Eastern (Tropical Pacific Ocean, by Julio Berdegue A., Inter-American Tropical Tuna Commission Bulletin, vol. III, no. 1, illus., printed in English and Spanish. Inter-American Tropical Tuna Commission, La Jolla, Calif., 1958.

CEYLON:

Administration Report of the Director of Fisheries for 1957, 31 pp., printed. Government Publications Bureau, Colombo, Ceylon, August 1958. Progress reports for the year 1957 are presented by the Department of Fisheries. Among the subjects covered are: Colombo plan aid; extended technical assistance program of F. A. O.; fishing disputes and regulations; fishermen's cooperative societies; loans to individual fishermen; coastal navigation aids; pearl bank survey; fresh-water fisheries; brackish-water fisheries; and biological and technological research. Statistical data are also included on the production of fresh and cured fish, and imports and exports of fishery products and byproducts.

COMMON MARKET:

"Central America Creates a Common Market," by R. M. Dawson, article, Foreign Trade, vol. 110, no. 10, November 8, 1958, p. 11, printed, single copy 20 Canadian cents. Department of Trade and Commerce, The Queen's Printer, Government Printing Bureau, Ottawa, Canada. After six years of study, Guatemala, El Salvador, Honduras, Nicaragua, and Costa Rica have signed a treaty setting up a Common Market, plus an agreement on industrial integration. The principal features of the treaty are: (1) establishment of a free trade area in the five countries; (2) operation of the treaty for an initial period of ten years; (3) establishment of a Central American Trade Commission; (4) undertaking to refrain from according duty-free entry to imports from outside the area of the products selected for free-trade-area treatment; (5) refusal of subsidies for export of merchandise included in the free trade agreement; and (6) adoption of measures to stimulate establishment or enlargement of regional industries.

CONSUMPTION:

"Use of Fishery Products by Households in Spring 1955," by Harry Sherr, article, The National Food Situation, NFS-86, October 1958, pp. 19-35, illus., processed. Agricultural Marketing Service, U. S. Department of Agriculture, Washington 25, D. C. Detailed data on food consumed at home in a week in spring 1955 were collected from 6,060 housekeeping households throughout the nation. This survey yielded more information than has ever been collected before on the consumption of fishery products at home. Findings showed that almost two-thirds of the households used fishery products during the week surveyed, but only 2½ cents of the average dollar spent for food used at home went for these products; the largest household market for fishery products was in the Northeast, the smallest in the West; and urban households provided a better market than rural. The survey also showed that of the fishery products used at home per person, the fresh and frozen group represented almost two-thirds of the total, and the canned a little over a third; canned fish consumption at home per person averaged higher among urban than rural households, and higher among single-person households than those of two or more persons; households in the Northeast and West were the leading consumers of canned tuna; those in the south were the heaviest consumers of canned salmon; and urban households used more canned fish per person in a week in spring 1942 than in a similar period in 1948 and 1955. Variations in food customs and availability of items, more than variations in income, accounted for differences in "at home" consumption of fishery products among the four regions and, within each region, by urbanization.

COOKERY:

A Handbook of Handling, Cooking, Serving U. S. Mountain Trout, 8 pp., illus., printed, 10 cents. U. S. Trout Farmers Association, Box 546, Buhl, Idaho. In addition to the many interesting recipes for cooking trout, this booklet has information on the purchasing of fresh or frozen trout, market forms, storage of frozen trout,

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and thawing. It also describes and illustrates methods of boning cooked trout and boning trout before cooking--butterfly style.

FOOD AND AGRICULTURE ORGANIZATION:
Procedures for the Testing of Intentional Food Additives to Establish Their Safety for Use. (Second Report of the Joint FAO/WHO Expert Committee of Food Additives), FAO Nutrition Meeting Series No. 17, 19 pp., printed, 30 U. S. cents. Food and Agriculture Organization of the United Nations, Rome, Italy, 1958. (For sale by International Documents Service, Columbia University Press, 2960 Broadway, New York 27, N. Y.)

The State of Food and Agriculture, 1958, 232 pp., illus., printed, US$2.50. Food and Agriculture Organization of the United Nations, Rome, Italy. Fisheries are mentioned in a few places. (For sale by International Documents Service, Columbia University Press, 2960 Broadway, New York 27, N. Y.)

Yearbook of Fishery Statistics--Production, 1957, vol. VII, 311 pp., illus., processed in English, French, and Spanish, US$4.00. Food and Agriculture Organization of the United Nations, Rome, Italy, 1958. (Sold in United States by Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N. Y.) The newest edition of the FAO Yearbook contains statistics on catches from all countries, quantities landed by countries and by species; and production of preserved and processed fishery commodities. Since this is an interim issue of the FAO Yearbook, the sections on fishing craft have been omitted. However, the Notes section is reprinted unchanged from volume VI even though some of it refers to the omitted sections.

FRANCE:
La Peche Maritime (The Marine Fishery), vol. 37, no. 966, September 1958, 64 pp., illus., printed in French. Les Editions Maritimes, 190 Boulevard Haussmann, Paris, France. Contains, among others, the following articles: "Importance et Caracteristiques de Notre Peche aux Crustaces" (Importance and Characteristics of our Crustacean Fisheries), by L. F. Plouas; "Le Marche de Thon Tropical d'Origine Francaise - Le Marche Commun et les Pays Importateurs de l'Europe Occidentale" (The Market for French Tropical Tuna - The Common Market and the Importing Countries of Western Europe), by A. Sahut-Morel; "La Peche des Crustaces a Camaret" (The Crustacean Fishery at Camaret), by R. Pennee; "Douarnenez et la Peche aux Crustaces" (Douarnenez and the Crustacean Fishery), by R. Bolopion; "Audierne, Port de la Langouste Rouge" (Audierne, the Red Lobster Port), by J. Couespel du Mesnil; "L'Industrie Sud-Africaine de la Langouste" (The South African Lobster Industry), "La Protection du Homard au Danemark" (The Protection of the Danish Lobster); "Particularites du Traitement Frigorifique des Crustaces" (Details of the Refrigeration of Crustaceans); "La Conservation des Homards Vivants (The Preservation of Live Lobsters); and "L'Expedition par Avion des Homards (The Transportation of Lobsters by Air).

La Peche Maritime (Marine Fishery), vol. 37, no. 967, October 1958, 64 pp., illus., printed in French. Les Editions Maritimes, 190 Boulevard Haussmann, Paris, France. Contains, among others, the following articles: "Ou Va la Peche du Hareng?" (Where is the Herring Fishery Headed?), by Jean Delpierre; "La Peche aux Harengs a Dieppe" (The Herring Fishery at Dieppe), by G. Martin; "L'Industrie du Hareng a Fecamp en 1958" (The Herring Industry at Fecamp in 1958), by J. Ledun; "Le Marche Mondial du Hareng" (The World Market for Herring), by Geep; "La Peche du Hareng aux Pays-Bas" (The Herring Fishery in the Low Countries), by Dr. H. A. H. Boelsman Kranenburg; "La Peche du Hareng au 'Chalut-Boeuf' (The Herring Fishery with the "Ox Trawl"); and "La Congelation a Sec du Hareng en Norvege" (The Dry Freezing of Herring in Norway).

GENERAL:
Important Fisheries of the Atlantic Coast (A Supplement to the Sixteenth Annual Report of the Atlantic States Marine Fisheries Commission, 22 West First St., Mount Vernon, N. Y., September 1958. Brief summaries of existing knowledge of the 23 most important migratory fish species and 8 important shellfish are presented. The case for scientific management of fisheries rests on the knowledge that when animal populations are exploited by man they compensate for this increased mortality by increasing their rates of survival and growth. One of the primary objectives of fishery research is to determine what level of fishing intensity produces an optimum catch, and to devise methods to maintain this equilibrium. Contains brief discussions and graphs on sea herring, sea scallop, silver hake, cod, haddock, ocean perch, pollock, the industrial fishery (mainly red hake), yellowtail flounder, summer flounder, winter flounder, menhaden, common mackerel, king mackerel, Spanish mackerel, American shad, croaker, sea trout (weakfish), spot, scup, bluefish, king whiting, striped bass, mullet, oyster, surf clam, soft clam, hard clam, northern lobster, blue crab, and shrimp.

HANDLING OF FISH:
From Trawler to Trader, 33 pp., illus., printed. Department of Scientific and Industrial Research, Charles House, 5-11 Regent Street, London, SW1, England, June 1958. This booklet presents an approach to the simplification of handling methods at fish docks. It considers the landing, selling, and transportation of fish, and shows how complex are the problems of handling. Written in simple, nontechnical language, and with many sketches and photos, it should be of great help to members of the fishing industry.

ITALY:
Food Regulations of Italy, by H. F. Shepston, Operations Report WTIS, Part 2, No. 58-65, 8 pp., printed, single copy 10 cents. (For sale by the Superintendent of Documents, U. S. Government

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Printing Office, Washington 25, D. C.) Bureau of Foreign Commerce, United States Department of Commerce, Washington, D. C., September 1958. Italian food regulations are arranged in this report under the headings of general and special, the latter dealing both with the special marking and labeling requirements applying to foodstuffs and with the special food regulations the requirements are designed to enforce. Specific regulations on canned fish are included. Under special requirements, the items that need special marking and labels are listed; the mandatory marks or labels are described; the definitions and/or quality specifications required to be met for use of prescribed names are given, together with any other pertinent regulations; and reference is made to the "legal basis," taken here to mean either the codified source where the applicable legislation is found or the individual law.

JAPAN:
Bulletin of the Hokkaido Regional Fisheries Research Laboratory, No. 18, August 1958, illus., printed in Japanese with summaries in English. Hokkaido Regional Fisheries Research Laboratory, Yoichi, Hokkaido, Japan. Contains, among others, the following articles: "On the Maturity of Pacific Salmon (Oncorhynchus nerka, O. keta and O. gorbuscha) in Offshore, with Reference to the Seasonal Variation of Gonad Weight," by Teruo Ishida and Kiichi Miyaguchi; "Studies on Fish Silages - I. On the Processing of Acid Silages and Fermented Silages," by Tsutomu Uno, Toshio Tokunaga, and Masayoshi Nakamura; "Studies on the Characteristic Qualities of Fish Meat - I. On Kamaboko - (Steamed Fish Cake) Forming Ability," by Tsutomu Uno and Masayoshi Nakamura; "The Studies on Freezing and Refrigeration of Marine Products--Part I. On Drip in Frozen Muscle of the Alaska Pollock," by Shu Tanaka, Tadashi Kubo, and Yukio Takayama; and "Studies on the Preservation of Marine Products - VI. On the Bacteria in Manufacturing Process of Fish Meal. No. 1," by Masatoki Sasajima, Hiroshi Oshima, and Tomoko Ishigaki.

LOBSTERS:
"La Langosta Blanca de Mauritania" (The White Spiny Lobster of Mauritania), by Miguel Massuti Oliver, article, Puntal, vol. 5, no. 52, July 1958, pp. 24-25, illus., printed in Spanish. Puntal, Apartado 316, Alicante, Spain. A short resume of the processing of spiny lobster from its capture along the "Canary Coast" until its sale in Cadiz. It has little popularity in Spain, but is exported to the United States.

Maine's King Lobster, by George H. Taylor and Robert L. Dow, 43 pp., illus., printed. Department of Sea and Shore Fisheries, Augusta, Me., July 1958. "This publication," says the Commissioner of the Department of Sea and Shore Fisheries, "is intended both to tempt the appetite and to inform the mind." It discusses in detail the past and present lobster industry, conservation problems, methods of capture, and the biology of the Maine lobster.

MAINE:
List of Publications, July 1, 1957, 5 pp., printed. Dept. of Sea and Shore Fisheries, Augusta, Me., 1957.

MUSSELS:
"A Monograph of the Freshwater Mussels (Mollusca: Pelecypoda) of the Australian Region," by D. F. McMichael and I. D. Hiscock, article, Australian Journal of Marine and Freshwater Research, vol. 9, no. 3, September 1958, pp. 372-508, 19 plates, printed US$1.10 single copy. Commonwealth Scientific and Industrial Research Organization, 314 Albert St., East Melbourne, C.2, Victoria, Australia.

NETTLES:
"The Portuguese Man-of-War," by Kenneth L. Gosner, article, Nature Magazine, vol. 51, no. 7, August-September 1958, pp. 358-360, illus., printed, single copy 50 cents. American Nature Association, 1214 16th St., N.W., Washington 6, D. C. The Portuguese man-of-war (Physalia) is a member of the same phylum as the jellyfish and hydra, and is not one animal but a colony of specialized individuals, including both polyps and medusas. It is conspicuous on the surface of the open sea, chiefly in the tropics, for its gas-filled bag topped by a diagonal pinkish crest. The long tentacles are heavily armed with nematocysts, which are harpoon-like in action and carry a virulent poison, enabling them to capture and paralyze their prey, even man, to whom its sting can be lethal.

NEW ZEALAND:
Report on Fisheries for 1957, 41 pp., illus., printed. Marine Department, Wellington, New Zealand, 1958. Describes with the aid of statistical tables the fish landings, by species and port, by quantity and value; exports and imports of fishery products; fish-liver oil production; whaling, 1957 season; oyster fishery; whitebait fishery, 1957 season; fresh-water fisheries and research; and marine research.

NORWAY:
Norway Exports, Autumn 1958, 64 pp., illus., printed, Export Council of Norway, H. Heyerdahls Gate 1, Oslo, Norway. This issue provides, among others, several articles on the whaling industry. The first article entitled "10,000 Miles to Hunt the Biggest of Beasts" tells of Norway's participation in the Antarctic whaling industry and about the problems that face whaling today. Whale oil is refined and hardened into fat for margarine, and it yields a number of technical products too that are important for a variety of industries. Whale oil processing is the subject of another article.

OYSTER CULTURE:
Useful Publications for Oyster Farmers of the Maritimes, by J. C. Medcof, General Series Circular No. 32, 3 pp., printed. Biological Station, Fisheries Research Board of Canada, St. Andrews, N.B., Canada, October 1958. A list of publications which are useful to the oyster farmer.

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These documents summarize the history of work by the Department of Fisheries and the Fisheries Research Board of Canada since 1929 when they combined efforts to foster what may be called modern oyster culture.

PACKAGING:

Protective Packaging Problems, by L. V. Burton, Technical Aids for Small Manufacturers No. 62, 8 pp., printed. Small Business Administration, Washington 25, D. C., August 1958. Packaging can be very simply defined as the preparation of goods for shipment and marketing. This leaflet tells the main points to be considered in packaging and how to go about dealing with them.

PLANKTON:

Diurnal Fluctuation in Photosynthetic Rate and Chlorophyll "a" Content of Phytoplankton from Eastern Pacific Waters, by Bell M. Shimada, 4 pp., illus., printed. (Reprinted from Limnology and Oceanography, vol. 3, no. 3, July 1958, pp. 336-339.) American Society of Limnology and Oceanography, Department of Zoology, Indiana University, Bloomington, Ind.

SALMON:

Salute to the Sockeye (Commemorating the British Columbia Centennial, 1958), 24 pp., illus., printed. International Pacific Salmon Fisheries Commission, New Westminster, B. C., Canada, 1958. Describes the history of the sockeye of the Fraser River; the Salmon Commission; and the races of sockeye, and their identification. One entire chapter deals with the Adams River run and discusses the rebuilding of a destroyed salmon run, the catch, spawning, and development from egg to smolt. One outstanding fact mentioned is the phenomenal build-up in the catches of Adams River fish, which increased from 2.33 million fish in 1938 to 8 million in 1954. Many excellent black-and-white and color photographs are included.

SANITATION:

The Principles of Scientific Cleaning for the Fish Industry, by R. Spencer, Food Investigation Leaflet No. 17, 12 pp., printed, 20 U. S. cents. British Information Services, 45 Rockefeller Plaza, New York 20, N. Y., 1958. The correct use of detergents and disinfectants, together with the use of mechanical or other aids to cleaning, has come to be known as scientific cleaning. The author recommends three points to follow for effective scientific cleaning: (1) make subsequent cleaning easy by arranging to have smooth, impervious surfaces which are easily cleaned, such as metal, tile, or plastic; (2) clean the surface with warm water and a suitable detergent and rinse with hot water; and (3) disinfect with steam or a chemical disinfectant and rinse again if the latter has been used. He adds that recommendations of the best type of detergent for the various cleaning jobs can only be given after experimental work.

TAX GUIDE:

Tax Guide For Small Business, 1959 Edition, 128 pp., printed, 35 cents. Internal Revenue Service, Washington, D. C. (For sale by the Superintendent of Documents, Government Printing Office, Washington 25, D. C.) The new edition of this tax guide (for use in filing the 1958 income tax returns and excise tax returns and other returns for 1959) contains explanations and answers to most of the tax problems of the small-business man. This booklet answers the Federal tax questions of corporations, partnerships, and sole proprietorships. It explains in plain layman's language the tax results from buying a business, starting a business, operating a business, and the sale and other disposition of a business. Some of the many subjects covered are: accounting periods and methods; installment sales; inventories; business expenses; net operating losses; sales of fixed assets; Social Security and withholding taxes; repairs and improvements; depreciation; self-employment taxes; excise taxes; and others. In addition it contains a tax calendar for 1959 which should prove helpful to all businessmen throughout the year, since it indicates what he should do and when he should do it in regard to the various Federal taxes. The booklet also has a check list of special interest to the man just starting in business in that it affords a quick method for determining what Federal taxes he may be liable for.

TRADE LIST

The Office of Economic Affairs, Bureau of Foreign Commerce, U. S. Department of Commerce, Washington 25, D. C., has published the following mimeographed trade list. Copies may be obtained by firms in the United States from that office or from Department of Commerce field offices at $2 each.

Canneries--Australia, 7 pp., (October 1958). Lists the names of canneries and addresses and types of products handled. Includes fish canneries registered for export.

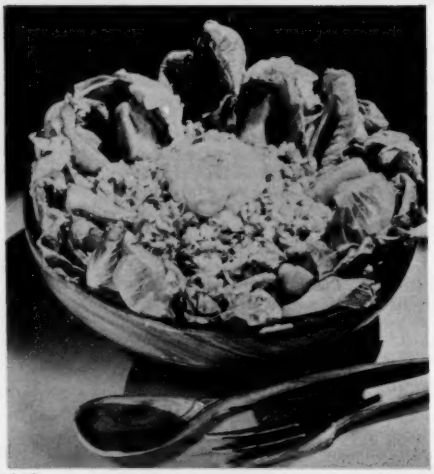
MARKET-WISE SHOPPERS SERVE WHITING

Market-wise shoppers are discovering that whiting is a reasonably-priced fish that is plentiful. It is caught commercially in the cool waters of the North Atlantic off the New England and Middle Atlantic States.

Whiting is a slender, silver-gray fish with a silvery underside. It is sold whole, drawn, dressed, or as fillets. The size of the whole fish ranges anywhere from one-half to four pounds.

The meat is mild-flavored and the texture is very tender. Whiting, or any fish, has no tough tissue to be tenderized. When flaked it is good in creamed dishes and salads because of the tenderness of meat and the white color.

The home economists of the U. S. Bureau of Commercial Fisheries recommend two recipes using flaked whiting. "Baked Flaked Whiting" and "Whiting Salad."



WHITING SALAD

- 2 CUPS FLAKED WHITING
- ½ CUP CHOPPED CELERY
- ½ CUP COOKED PEAS
- 2 TABLESPOONS CHOPPED SWEET PICKLE
- 2 TABLESPOONS CHOPPED ONION
- 3 HARD-COOKED EGGS, CHOPPED
- 1 TEASPOON SALT
- ½ CUP MAYONNAISE
- 2 TABLESPOONS LEMON JUICE
- LETTUCE

Combine all ingredients except the lettuce, being careful not to break the fish into small pieces. Serve on lettuce. Serves 6.

FLAKED WHITING

- 1 POUND WHITING FILLETS
- 1 QUART WATER
- 1 TABLESPOON SALT

Skin fillets and place in boiling salted water. Cover and return to boiling point; simmer for 10 minutes or until fish flakes easily when tested with a fork. Drain and flake. Serves 6.

This recipe will yield 2 cups flaked whiting that can be used in recipes calling for flaked fish.

BAKED FLAKED WHITING

- 2 CUPS FLAKED WHITING
- 1½ TABLESPOON BUTTER OR OTHER FAT
- 2 TABLESPOONS FLOUR
- ½ TEASPOON SALT
- DASH PEPPER
- 1¾ CUPS MILK
- 1 CUP GRATED CHEESE
- 2 CUPS COOKED RICE
- 1 CUP COOKED PEAS
- 2 TABLESPOONS BUTTER OR OTHER FAT, MELTED
- ½ CUP DRY BREAD CRUMBS

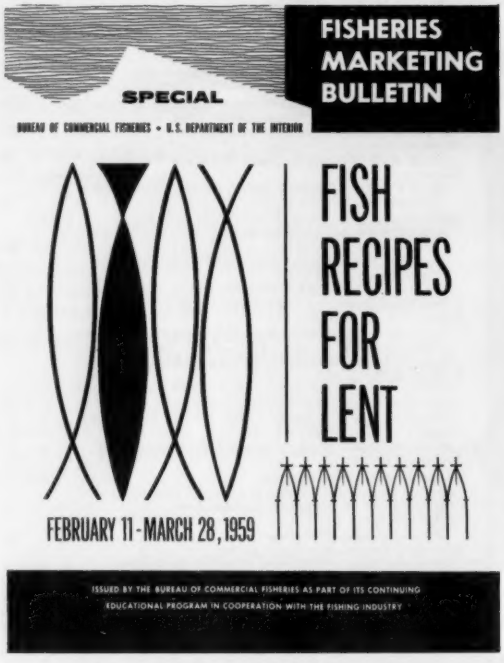
Melt butter; blend in flour and seasonings. Add milk gradually and cook until thick and smooth, stirring constantly. Stir in cheese and heat until melted. Combine fish with rice, peas, and cheese sauce. Place mixture in a well-greased casserole. Combine butter and crumbs; sprinkle over mixture. Bake in a moderate oven, 375° F., for 30 minutes or until brown. Serves 6.

CONTENTS (CONTINUED)

INT.-DUP. SEC., WASH., D.C.48198

FISH FOR LENT

Lent this year is February 11-March 28. The Lenten season is traditionally one during which fish and shellfish are featured prominently in most menu planning. While we like to say "Make every day a fish day!", it is during Lent that special emphasis is placed on fish.



Cover page of 16-page Food Editor's Fact Sheet

As a part of its consumer education program, the U. S. Bureau of Commercial Fisheries is again issuing special releases and recipes for use during Lent. A bulletin has been prepared for school-lunch use featuring six recipes centered around fish dishes for school children. These recipes will appear in state school-lunch bulletins going to managers and cooks in schools which daily feed over 10 million children.

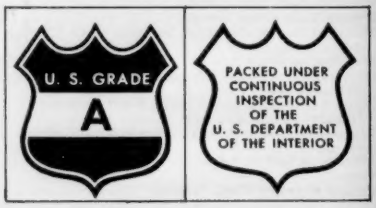
A 16-page Food Editor's Fact Sheet has been mailed to about 1,800 food editors, nutritionists, and dietitians throughout the country. These fact sheets feature newsworthy tips and recipes on fish and shellfish.

Each year, at this time, a splendid opportunity is available to the fishing industry to increase the sale of fishery products.

In the past several years, the fishing industry has made great strides in improving the quality of its products. One important step has been the establishment of voluntary Federal standards of grade and condition for a continually increasing number of fishery products. Compliance with these standards is voluntary and not mandatory. Thus, some packers of a product for which standards have been adopted may pack their products under government inspection and grade, while others may not. From the consumer's standpoint, the evidence of grading appears on the package in the form of a shield as shown below.

Only fishery products packed under continuous inspection of the U. S. Department of the Interior (USDI) may be officially graded and show on the label "U. S. Grade A." At the present time grading standards have been officially announced for the following fishery products:

Fish Sticks
Fish Blocks from which the sticks (and other "portion control" items) are cut
Frozen Raw Breaded Shrimp



Very soon will be added:

Halibut Steaks
Haddock Fillets

Other fishery products for which standards are in the making are: salmon steaks, raw breaded fish portions, cooked breaded fish portions, raw fish portions, ocean perch fillets, and cod fillets.

For these products that are available with this "U. S. Grade A" guarantee of top quality, it is recommended that the consumer look for this seal and, wherever possible, buy USDI-inspected fishery products.